WO 2005/061725

PCT/CA2004/002172

# 14P20 Rec'd PCT/PTO 23 JUN 2006

## Sequence Listing

SEQ ID NO. 1

5 Q04984 and AAH23518 Chaperonin 10

1 magqafrkfl plfdrvlver saaetvtkgg-imlpeksqgk vlqatvvavg sgskgkggei
61 qpvsvkvgdk vllpeyggtk vvlddkdyfl frdgdilgky vd

10

SEQ ID NO. 2

NM\_002157 and U07550

15 Human chaperonin 10 mRNA, complete cds

1 gctacactag agcagagtac gagtctgagg cggagggagt aatggcagga caagcgttta
61 gaaagtttct tccactcttt gaccgagtat tggttgaaag gagtgctgct gaaactgtaa
121 ccaaaggagg cattatgctt ccagaaaaat ctcaaggaaa agtattgcaa gcaacagtag
20 181 tcgctgttgg atcgggttct aaaggaaagg gtggagagat tcaaccagtt agcgtgaaag
241 ttggagataa agttcttctc ccagaatatg gaggcaccaa agtagttcta gatgacaagg
301 attatttcct atttagagat ggtgacattc ttggaaagta cgtagactga aataagtcac
361 tattgaaatg gcatcaacat gatgctgcc attccactga agttctgaaa tctttcgtca
421 tgtaaataat ttccatattt ctctttata ataaactaat gataactaat gacatccagt
25 481 gtctccaaaa ttgtttcctt gtactgatat aaacacttcc aaataaaaat atgtaaat

SEQ ID NO. 3

30 P05109 Calgranulin A

> 1 mltelekaln siidvyhkys likgnfhavy rddlkkllet ecpqyirkkg advwfkeldi 61 ntdgavnfge flilvikmgv aahkkshees hke

35

SEQ ID NO. 4

A12027

40 Macrophage migration inhibition factor (MRP-14)cDNA from Human placenta (formula v)

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1 cttgggttgc ttccaccttt tggctcttgt aaataatgct gctatgaaca tgaatgtaca
      61 aacatctgtt tgaatccctg cattcaattc ttttgcatat atacccagga gcagaatgat
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     121 ggatcatatg gtaattetgt gtttatttat ttgaggaaca aacttgeegt ttteeataae
     181 agetgeacta ttttacatte ceaetaacag tgeattagge ttecaattet etatgeeete
     241 accaacactt gttttctggg ttttaaaaaga agtagtagtc atccttgtag gtgtcaggtg
     301 gtatctcatt gtcgttttgc ttcatgtttt cctaaagatt agtaattttc atatqcttat
     361 tgaccatttg tatatettet teggagaagt gtetatttga gtettteece aattttgatt
     421 ggtttgtttg ttttttgttg ttgagttgta gggattcttt tatattctgg atattaatcc
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     481 cttatcagat atttgtttta caaatatttt ctttgtaaca acagaaacac accacagtct
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     601 tectectgaa atectgggga attggecace tectettete etettaggea tgaagegegt
     661 ctggcttctc caaagaactc ttcccctcca ctacctcaga gttagcttcc tctcttcagc
55
     721 cagtgatcct ggggtcccag acacaataat taaccaagag agggtgaaag gctccctgct
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|     |            |            |            |            | •          | •           |            |
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|     | 841        | tcccagggca | tggtccatcc | ccagctttca | cagaacagga | aagctgtgga  | ggagtgtggg |
|     | 901        | cagcagggta | ggaatggata | tagcccttgg | caacaacaca | tttccccaca  | aagcacccac |
|     | 961        | ccaaaagaac | aacaacgata | gttttagttt | ttagtaatga | gaacaatagt  | tctcatgact |
| 5   | 1021       | aaaagccatc | agccaggaca | ctgttctcaa | cccttttgcg | gtctttggac  | cctttgaaac |
|     | 1081       | tctgacagaa | gccatggagg | aatgttctca | ctgagtgcat | gcactcaaaa. | tgatgcattc |
|     | 1141       | aacttcaatt | cagtttcagg | gatgtatggc | ctgaccacca | atgcagggga  | ttagcaatcg |
|     | 1201       | caatagtgga | gagggcatgg | gagtgggaat | ctggctggat | caagcaagtg  | gatgccagca |
|     | 1261       | gcccagaaaa | agagecece  | tacctgcttt | ttccttcctg | ggcactattg  | cccagcaaat |
| 10  | 1321       | gccttcctct | ttccgcttct | cctacctccc | cacccaaaat | tttcattctg  | cacagtgatt |
|     | 1381       | gccacattca | ctggttgaga | aacagagact | gtagcaactc | tggcagggag  | aagctgtctc |
|     | 1441       | tgatggcctg | aagctgtggg | cagctggcca | agcctaaccg | ctataaaaag  | gagctgcctc |
|     | 1501       | tcagccctgc | atgtctcttg | tcagctgtct | ttcagaagac | ctggtaagtg  | ggactgtctg |
|     | 1561       | ggttggcccc | gcactttggg | cttctcttgg | ggagggtcag | ggaagtggag  | cagccttcct |
| 15  | 1621       | gagagaggag | agagaaagct | cagggaggtc | tggagcaaag | atactcctgg  | aggtggggag |
|     | 1681       | tgaggcaggg | ataaggaagg | agagtatcct | ccagcacctt | ccagtgggta  | agggcacatt |
|     | 1741       | gtctcctagg | ctggactttt | cttgagcaga | gggtggggtg | gtaaggaaag  | tctacgggcc |
|     | 1801       | cccgtgtgtg | tgcacatgtc | tctgtgtgaa | tggacccttc | cccttcccac  | acgtgtatcc |
|     | 1861       | ctatcatccc | acccttccca | ccagaggcca | tagccatctg | ctggtttggt  | tatttgagag |
| 20  | 1921       | tgcaggccag | gacaaggcca | tcgcttgggg | catgaatcct | ctgcgtactg  | ccctggccag |
|     | 1981       | atgcaaattc | cctgccatgg | gattccccag | aaggttctgt | ttttcaggtg  | gggcaagttc |
|     | 2041       | cqtqqqcatc | atgttgaccg | agctggagaa | agccttgaac | tctatcatcg  | acgtctacca |
|     | 2101       | caagtactcc | ctgataaagg | ggaatttcca | tgccgtctac | agggatgacc  | tgaagaaatt |
|     | 2161       | gctagagacc | qaqtgtcctc | agtatatcag | ggtgaggagg | ggctgggtgt  | ggcgggggct |
| 25  | 2221       | ctctgcctgg | tcctggggct | gccctgggcc | agcggtcctc | cctgccaccc  | ttcatagatg |
|     | 2281       | ctatgcctcg | gctctctctg | agatctttaa | actctggctt | cttcctcctc  | aatcttgaca |
|     | 2341       | gaaaaagggt | gcagacgtct | ggttcaaaga | gttggatatc | aacactgatg  | gtgcagttaa |
|     | 2401       | cttccaggag | ttcctcattc | tggtgataaa | gatgggcgtg | gcagcccaca  | aaaaaagcca |
|     | 2461       | tgaagaaagc | cacaaagagt | agctgagtta | ctgggcccag | aggctgggcc  | cctggacatg |
| 30  | 2521       | tacctgcaga | ataataaagt | catcaatacc | tcatgcctct | ctcttatgct  | tttgtggaat |
| •   | 2581       | gaggttcctc | ggtgtggagg | gagggttgga | aaacccaaag | gaagaaaaag  | aaatctatgt |
|     | 2641       | tatcccaccc | tacctctcac | aagcctttcc | tgctttaccc | ctcacctggc  | ctctgcccca |
|     | 2701       | cattccttca | gcccctcatt | tcgagcattg | gatttgaggc | ttaaggattc  | aaaaagtcgt |
|     | 2761       | catgaatata | gctgatgatt | ttatagtggt | tctgaaatgg | gtcggggatt  | tgggaacagg |
| 35  | 2821       | gtggtagtat | aagaacaact | gatactgttc | tctaagctaa | atcttagctt  | ccagctacct |
|     | 2881       | gtcttagatg | tagctcttgg | gaaccttaga | gtgatagcta | catagaagtg  | tgtgggtgtg |
|     | 2941       | tatatatata | tctgtgtgtg | tgtgtgtgag | agagagacag | acagaaagag  | agcaagagag |
|     | 3001       | qqaaqqqqqq | agaggctgat | tgtgtgtgtg | gtgtgatgta | ggtggacaat  | gttcagagtc |
|     | 3061       | ctccattaac | aggataatcc | tcacacctgt | ccacatacct | gtagtttgtc  | cttggggatt |
| 40  | 3121       | ttgaaaattt | tteeteecte | tccactccca | aactcccaac | tcaattaaat  | gataaaggaa |
|     | 3181       | taggcaaata | ggaaaataaa | ttagtaaaac | ttaagtcaaa | gaataggtta  | ttcatacgct |
|     | 3241       | gcctatggga | ttctatgctt | tgtgatcaga | aaattatcta | aaaaatactt  | cccaagggct |
|     | 3301       | ggtacaaggg | aggccagaag | acgagtggtt | cttctctgag | gtggacatta  | aaaaaagaag |
|     | 3361       | aaaatgaagg | ggaacctttt | gacaagaatg | tcaccccaaa | ctggattttc  | atgctgtggt |
| 45  | 3421       | gtggggaatt | ttctgttgtc | ctcacttagg | tgctggggca | gtggtgttag  | tgatgggtaa |
|     | 3481       | aaaqqtaqqa | agctgtcaca | gaatcactaa | accagggttc | ttaacttgtc  | tgtctataca |
|     | 3541       | tctctgaaat | tgggttgaag | ttgtgtgcat | cattttgagt | gacgcactga  | gaacattcct |
|     | 3601       | ccacqqcttc | catcgagagt | ctcgaaaagg | cccaacacct | caaaaaggtt  | aagaacactt |
|     | 3661       | gtcctgctta | ctggttttta | gtaacaaatg | gcagagtatt | tctctctgtc  | tctctctctt |
| -50 | 3721       | tttttttt   | tttttttgag | acacagggtc | ttgtctgtca | cgtggactag  | agtacaatgg |
|     | 3781       | gcatgatcat | gggctcactg | tagcctcgaa | cacctgggct | caagtaatcc  | tcccacctca |
|     | 3841       | gcctctttag | tagctgggac | tacagcatga | gccactgccc | ttggctaatt  | tttaaattat |
|     | 3901       | ttttttgtag | agatggaaac | ttgctatgtt | gcccaggcta | gtctcaaact  | cctggactca |
|     | 3961       | agcgatcctc | ctaccttggc | ctcccaaagt | gctgagatta | cagtgtgatc  | cacaccacac |
| 55  | 4021       | ctggccaaag | attggagtat | ttttattgct | attgttgtgc | tgggtgggtg  | ggtgggtgta |
|     | <b>-</b> - | J.J J.J    |            |            |            |             |            |

- 3 -

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4081 tgctttgtgg ggacgtgtgt tgttgccaag ggctaaatca gttcctaccc tgctqcccac
    4141 agtectecae agettteetg etetgtgaag etaaggatae acceegatga taagetgtea
    4201 acata
    SEQ ID NO. 5
    NM 002964
    Homo sapiens S100 calcium binding protein A8 (calgranulin A) S100A8,
10
      1 atgtetettg teagetgtet tteagaagae etggtgggge aagteegtgg geateatgtt
     61 gaccgagetg gagaaageet tgaactetat catcgacgte taccacaagt actecetgat
    121 aaaggggaat ttccatgccg tctacaggga tgacctgaag aaattgctag agaccgagtg
    181 tcctcagtat atcaggaaaa agggtgcaga cgtctggttc aaagagttgg atatcaacac
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    421 aaaaaaaa
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    SEQ ID NO. 6
    P06702
25
    Calgranulin B/MRP-14
     1 mtckmsqler nietiintfh qysvklghpd tlnggefkel vrkdlgnflk kenknekvie
    61 himedldtna dkqlsfeefi mlmarltwas hekmhegdeg pghhhkpglg egtp
30
    SEQ ID NO. 7
    X06233
    Human mRNA for calcium-binding protein in macrophages (MRP-14)
35
    macrophage migration inhibitory factor (MIF)-related protein
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    gccacggcca cagtcatggt ggccacggcc acagccaccc at
45
    SEQ ID NO. 8
    M21064
    Human migration inhibitory factor-related protein 14 (MRP14) gene,
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WO 2005/061725 PCT/CA2004/002172

- 4 -

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- 5 -

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    361 gvagssvavl cpynrkesks ikywclwega qngrcpllvd segwvkaqye grlslleepg
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    601 dprlfaeeka vadtrdqadg srasvdsgss eeqggssral vstlvplglv lavgavavgv
    661 ararhrknvd rvsirsyrtd ismsdfensr efgandnmga ssitqetslg gkeefvatte
    721 sttetkepkk akrsskeeae maykdfllqs stvaaeaqdg pqea
    SEQ ID NO. 10
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    NM 002644
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55
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    1381 agegaggggt gggttaagge ccagtaegag ggeegeetet ceetgetgga ggageeagge
    1441 aacggcacct tcactgtcat cctcaaccag ctcaccagcc gggacgccgg cttctactgg
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    1621 ccctgtcact ttccatgcaa attctcctcg tacgagaaat actggtgcaa gtggaataac
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    3181 catttcacac ataagaaaat tgaggtttgg aagagtgaag cgtttttctt tttcttttt
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-7-

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4021 atttctgtca ctcacatgga cccaagataa aagaatggcc aaaccctcac aacccctgat
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     4201 cctacaagct ggcacttgct aacaaatcag aaatatgaca attaatgatt aaagactgtg
     4261 attqcc
     SEQ ID NO. 11
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     P30086 - Homo sapiens
     Phosphatidylethanolamine binding protein (PEBP)
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      61 gklytlvltd pdapsrkdpk yrewhhflvv nmkgndissg tvlsdyvgsg ppkgtglhry
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     SEQ ID NO. 12
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     NM 002567
     Homo sapiens prostatic binding protein (PBP), mRNA
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    1381 ttaaattgat cgttcttcat gggggtaaga aaagctggtc tggagttgct gaatgttgca
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    1501 aaaaaaa
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    P39687 - Homo sapiens
    Acidic leucine-rich nuclear phosphoprotein 32 family member A
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1 memgrrihle lrnrtpsdvk elvldnsrsn egklegltde feeleflsti nvgltsianl
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    121 fncevtnlnd yrenvfkllp qltyldgydr ddkeapdsda egyvegldde eededeeeyd
    181 edaqvvedee dedeeeegee edvsgeeeed eegyndgevd deedeeelge eergqkrkre
    241 pedegeddd.
    SEQ ID NO. 14
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    NM_006305
    Homo sapiens acidic (leucine-rich) nuclear phosphoprotein 32
    family, member A (ANP32A), mRNA
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      61 gcggccgtgg gttcggggtt tattgattga attccgccgg cgcgggagcc tctgcagaga
     121 gagagegega gagatggaga tgggeagaeg gatteattta gagetgegga acaggaegee
     181 ctctgatgtg aaagaacttg tcctggacaa cagtcggtcg aatgaaggca aactcgaagg
     241 cctcacagat gaatttgaag aactggaatt cttaagtaca atcaacgtag gcctcacctc
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     421 tggcaacaaa attaaagacc tcagcacaat agagccactg aaaaagttag aaaacctcaa
     481 gagettagae etttteaatt gegaggtaae caacetgaae gaetaeegag aaaatgtgtt
     541 caageteete eegeaaetea catatetega eggetatgae egggaegaea aggaqqeece
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    P17066 - Homo sapiens
    Heat shock 70kDa protein
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      1 mqaprelavg idlgttyscv gvfqqgrvei landqgnrtt psyvaftdte rlvgdaaksq
     61 aalnphntvf dakrligrkf adttvqsdmk hwpfrvvseg gkpkvrvcyr gedktfypee
    121 issmvlskmk etaeaylgqp vkhavitvpa yfndsqrqat kdagaiaqln vlriinepta
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    361 lnksinpdea vaygaavqaa vlmgdkcekv qdlllldvap lslgletagg vmttligrna
    421 tiptkqtqtf ttysdnqpgv fiqvyegera mtkdnnllgr felsgippap rgvpqievtf
    481 didangilsv tatdrstgka nkititndkg rlskeeverm vheaeqykae deaqrdrvaa
    541 knsleahvfh vkgslqeesl rdkipeedrr kmqdkcrevl awlehnqlae keeyehqkre
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    SEQ ID NO. 16
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-9-

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NM_002155
Homo sapiens heat shock 70kDa protein 6 (HSP70B') (HSPA6), mRNA.
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SEQ ID NO. 17

X51757

Human heat-shock protein HSP70B gene

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     301 ctcgtgcgtg ggcgtgtttc agcagggccg cgtggagatc ctggccaacg accagggcaa
     361 ccgcaccacg cccagctacg tggccttcac cgacaccgag cggctggtcg gggacgcggc
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    2461 atgtaaaata tagttataga cctaaataag ct
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P14174
macrophage migration inhibitory factor - Homo Sapiens

1 mpmfivntnv prasvpdgfl seltqqlaqa tgkppqyiav hvvpdqlmaf ggssepcalc 61 slhsigkigg aqnrsyskll cgllaerlri spdrvyinyy dmnaanvgwn nstfa

SEQ ID NO. 19

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- 11 -

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NM_002415 - Homo Sapiens
Homo sapiens macrophage migration inhibitory factor
(glycosylation-inhibiting factor) (MIF), mRNA
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10 301 cggcggcgcg cagaaccgct cctacagcaa gctgctgtgc ggcctgctgg ccgagcgcct
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421 ctggaacaac tccaccttcg cctaagagcc gcagggaccc acgctgtctg cgctggctcc
481 acccgggaac ccgccgcacg ctgtgttcta ggcccgcca ccccaacctt ctggtggga
541 gaaataaacg gtttagagac t
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SEQ ID NO. 20

L19686

20 Homo sapiens macrophage migration inhibitory factor (MIF) gene, complete cds

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1 ctgcaggaac caatacccat aggctatttg tataaatggg ccatggggcc tcccagctgg
      61 aggetggetg gtgecacgag ggteceacag geatgggtgt cettectata teacatggee
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     121 ttcactgaga ctggtatatg gattgcacct atcagagacc aaggacagga cctccctgga
     181 aatctctgag gacctggcct gtgatccagt tgctgccttg tcctcttcct gctatgtcat
     301 tetettgata tgeetggeae etgetagatg gteecegagt ttaccattag tggaaaagae
     361 atttaagaaa ttcaccaagg gctctatgag aggccataca cggtggacct gactagggtg
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     421 tggcttccct gaggagctga agttgcccag aggcccagag aaggggagct gagcacgttt
     481 gaaccactga acctgetetg gacctegect cetteetteg gtgeeteeca geatectate
     541 ctctttaaag agcaggggtt cagggaagtt ccctggatgg tgattcgcag gggcagctcc
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     661 gactggagcc cttgaggaca tgtggcccaa agacaggagg tacaggggct cagtgcgtgc
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     721 agtggaatga actgggcttc atctctggaa gggtaagggg ccatcttccg ggttcaccgc
     781 egeatececa ecceeggeac agegeetect ggegactaac ateggtgact tagtgaaagg
     841 actaagaaag acccgaggcg aggccggaac aggccgattt ctagccgcca agtggagaac
     901 aggttggagc ggtgcgccgg gcttagcggc ggttgctgga ggaacgggcg gagtcgccca
     961 gggtcctgcc ctgcgggggt cgagccgagg caggcggtga cttccccact cggggcggag
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    1021 ccgcagcctc gcggggcgg ggcctggcgc cggcggtggc gtcacaaaag gcgggaccac
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    1141 ctctgcgcgg gtctcctggt ccttctgcca tcatgccgat gttcatcgta aacaccaacg
    1201 tgccccgcgc ctccgtgccg gacgggttcc tctccgagct cacccagcag ctggcgcagg
    1261 ccaccggcaa gccccccag gtttgccggg aggggacagg aagagggggg tgcccaccgg
    1321 acgaggggtt ccgcgctggg agctggggag gcgactcctg aacggagctg gggggcgggg
    1381 cggggggagg acggtggetc gggcccgaag tggacgttcg gggcccgacg aggtcgctgg
    1441 ggcgggctga ccgcgccett teetegcagt acategeggt geaegtggte ccggaccage
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    1561 agateggegg egegeagaac egeteetaca geaagetget gtgeggeetg etggeegage
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    1741 ctacatcaac tattacgaca tgaacgcggc caatgtgggc tggaacaact ccaccttcgc
    1801 ctaagageeg cagggaeeca egetgtetge getggeteea eeegggaaec egeegeaege
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- 12 -

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1981 gagcgaggtc gggaaacggt gttgggggcg ggggtcaggg ccgggttgct ctcctcgaac
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    2101 caqtqtcttt ccattctatg gcgtacgaag ggatgaggag aagttggcac tctgccctgg
    2161 gctgcag
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    SEQ ID NO. 21
    P31949
10
    Calgizzarin - Homo sapiens
     1 makissptet erciesliav fqkyagkdgy nytlsktefl sfmntelaaf tknqkdpgvl
    61 drmmkkldtn sdgqldfsef lnligglama chdsflkavp sqkrt
15
    SEQ ID NO. 22
    NM 005620 and D38583 - Homo sapiens
    Homo sapiens S100 calcium binding protein A11 (calgizzarin) (S100A11),
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      1 gggcaagget gggcegggaa gggcgtgggt tgaggagagg etccagacce gcacgeegeg
     61 cgcacagage teteagegee geteecagee acageeteee gegeeteget cageteeaac
    121 atggcaaaaa tetecageee tacagagaet gageggtgea tegagteeet gattgetgte
    181 ttccagaagt atgctggaaa ggatggttat aactacactc tctccaagac agagttccta
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    241 agetteatga atacagaact agetgeette acaaagaace agaaggaeee tggtgteett
    3.01 gaccgcatga tgaagaaact ggacaccaac agtgatggtc agctagattt ctcagaattt
    361 ottaatetga ttggtggcet agetatgget tgccatgact cetteeteaa ggetgteeet
    421 teccagaage ggacetgagg acceettgge eetggeette aaaeceacee eettteette
    481 cagcettet gecateatet ceacagecea eccateceet gageacacta accaceteat
30
    541 gcaggcccca cctgccaata gtaataaagc aatgtcactt ttttaaaaca tgaaa
    SEQ ID NO. 23
35
    P00938 and NP 000356 - Homo sapiens
    Triosephosphate isomerase
      1 mapsrkffvg gnwkmngrkq slgeligtln aakvpadtev vcapptayid farqkldpki
     61 avaaqncykv tngaftgeis pgmikdcgat wvvlghserr hvfgesdeli gqkvahalae
40
    121 glgviacige kldereagit ekvvfeqtkv iadnvkdwsk vvlayepvwa igtgktatpq
    181 qaqevheklr gwlksnvsda vaqstriiyg gsvtgatcke lasqpdvdgf lvggaslkpe
    241 fvdiinakq
45
    SEQ ID NO. 24
    Homo sapiens triosephosphate isomerase 1 (TPI1), mRNA
50
        1 cetteagege eteggeteea gegeeatgge geceteeagg aagttetteg ttgggggaaa
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     121 caaggtgeeg geegacaeeg aggtggtttg tgeteeeeet aetgeetata tegaettege
     181 ccggcagaag ctagatccca agattgctgt ggctgcgcag aactgctaca aagtgactaa
     241 tggggctttt actggggaga tcagccctgg catgatcaaa gactgcggag ccacgtgggt
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- 13 -

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301 ggtcctgggg cactcagaga gaaggcatgt ctttggggag tcagatgagc tgattgggca
     361 gaaagtggcc catgctctgg cagagggact cggagtaatc gcctgcattg gggagaagct
     421 agatgaaagg gaagctggca tcactgagaa ggttgttttc gagcagacaa aggtcatcgc
     481 agataacgtg aaggactgga gcaaggtcgt cctggcctat gagcctgtgt gggccattgg
5
     541 tactggcaag actgcaacac cccaacaggc ccaggaagta cacgagaagc tccgaggatg
     601 gctgaagtcc aacgtctctg atgcggtggc tcagagcacc cgtatcattt atggaggctc
     661 tgtgactggg gcaacctgca aggagctggc cagccagcct gatgtggatg gcttccttgt
     721 gggtggtgct tccctcaagc ccgaattcgt ggacatcatc aatgccaaac aatgagcccc
     781 atccatcttc cctaccettc ctgccaagec agggactaag cagcccagaa gcccagtaac
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     841 tgccctttcc ctgcatatgc ttctgatggt gtcatctgct ccttcctgtg gcctcatcca
     901 aactgtatct teetttactg tttatatctt caccetgtaa tggttgggac caggecaate
     961 ccttctccac ttactataat ggttggaact aaacgtcacc aaggtggctt ctccttggct
    1021 gagagatgga aggcgtggtg ggatttgctc ctgggttccc taggccctag tgagggcaga
    1081 agagaaacca tcctctccct tcttacaccg tgaggccaag atcccctcag aaggcaggag
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    1141 tgctgccctc tcccatggtg cccgtgcctc tgtgctgtgt atgtgaacca cccatgtgag
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SEQ ID NO. 25

20

X69723

H.sapiens TPI1 gene for triosephosphate isomerase.

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      121 aggtagactc cctgggtaca agggtgcctg ctcagcagtc gggcatgagc tgctccgatg
      181 ggcgaaggag gttgtctatt ccacagttgg agaggggccc tctctgcccc agtgggcgat
      241 ctgggctacg gccaagttgc caccagctag ttccgcttga aaaccacttc tggccccgtg
      301 ggggactcaa gtcgccaage gagggttccc ctgagegeeg gagetcacag gtctcgeett
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      361 gtcccgaaag ccccgcaatc gaggcggagg cgaccgagcc cccgactctc ctagaacgtt
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      481 ggagggggg cggggggcag ggctccgggg gactgggcgg gccatggcgg aggacggcga
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      601 agacactgac etteagegee teggeteeag egecatggeg eeeteeagga agttettegt
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      661 tgggggaaac tggaagatga acgggcggaa gcagagtctg ggggagctca tcggcactct
      721 gaacgeggee aaggtgeegg cegacacegg taageeeteg eegaggaggg gtetggeegg
      781 gccggggccg ggccggggca ggagtggcag cgcctctccc gaggcccgag gtccgggccg
      841 gtateegege ggaeetgatg eagggetgtg ggaegaggge egetggggte egggeagggg
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     1021 gcactggctg tgcccgccag gcgacggggt taggagccga gcccgaggct ctgcgggaga
     1081 ccgggggagg ctgggccgcg tgggcttccg ctccctgccc tggcctccgc gtgcgcgccg
     1141 ccgcacgtag ccccagactc ctccccctcc tcgccggcgt cgtcccgcgc cgagctgctg
     1201 etgecetgag cececagate tgaacceett ecetteggea acetgagega etecegeett
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    1261 ccacggaagg gaccgagccc gtgccaaaca ggctgagcga tttgggagtg aggagccatc
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    1441 agageegegg geetgateea aagaggeate eeettetegt teatteecea gaggeeteaa
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    1681 agggcagggt gagggccgtg gctctcaggg gtatctggaa ggctcttcga gttgagtgca
    1741 gacccagcct tgggctggaa aatggacaaa ggtcatcttg ctggggtgaa aagggggaga
    1801 gcagaaccaa gaagaagag gtgagggctg gggggctcca gggcactggt taggaattgt
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    1861 ggggaatgaa ggctttcttt agtctcatcc ccctgtggta ccatcttgtc ctcagaggtg
```

|     |      |            | cccctactge               |            |            |            |             |
|-----|------|------------|--------------------------|------------|------------|------------|-------------|
|     |      |            | cgcagaactg               |            |            |            |             |
|     |      |            | gtggagaggg               |            |            |            |             |
| _   |      |            | tgggctccct               |            |            |            |             |
| 5   |      |            | gcggagccac               |            |            |            |             |
|     |      |            | atgaggttag               |            |            |            |             |
|     |      |            | caagtctgtt               |            |            |            |             |
|     |      |            | cggagtaatc               |            |            |            |             |
| _   |      |            | ggttgttttc               |            |            |            |             |
| 10  |      |            | ctatccaggg               |            |            |            |             |
|     |      |            | catgctgatc               |            |            |            |             |
|     |      |            | gacttctcca               |            |            |            |             |
|     |      |            | gtaggccacc               |            |            |            |             |
|     |      |            | ttccctccat               |            |            |            |             |
| 15  |      |            | ggcctatgag               |            |            |            |             |
|     |      |            | cgggcccagg               |            |            |            |             |
|     |      |            | cacatggagc               |            |            |            |             |
|     |      |            | gtccaagggc               |            |            |            |             |
| -00 |      |            | cagaaaccac               |            |            |            |             |
| 20  |      |            | ggtcttactt               |            |            |            |             |
|     |      |            | tggctgaagt               |            |            |            |             |
|     |      |            | gagtggcttt               |            |            |            |             |
|     |      |            | atggaggtgg               |            |            |            |             |
| 25  |      |            | tcccaggctc               |            |            |            |             |
| 25  |      |            | gcttccttgt               |            |            |            |             |
|     |      |            | aatgagcccc               |            |            |            |             |
|     |      |            | gcccagtaac               |            |            |            |             |
|     |      |            | gcctcatcca               |            |            |            |             |
| 7.0 |      |            | caggccaatc               |            |            |            |             |
| 30  | 3661 | aaggtggctt | ctccttggct               | gagagatgga | aggegrage  | ggattigete | tangagerece |
|     | 3/21 | taggeeetag | tgagggcaga               | agagaaacca | taccatacta | coastageta | totagectaag |
|     |      |            | aaggcaggag               |            |            |            |             |
|     |      |            | cccatgtgag               |            |            |            |             |
| 25  |      |            | gcccagataa               |            |            |            |             |
| 35  |      |            | aaaaaacaag               |            |            |            |             |
|     |      |            | ttgcgtagca<br>ctctggggct |            |            |            |             |
|     |      |            | tcagcagctg               |            |            |            |             |
|     |      |            | acctcagcac               |            |            |            |             |
| 40  |      |            | gggcaagggc               |            |            |            |             |
| 40  | 4201 | ggaggagg   | geggeteagg               | tagagagaga | actotogoto | cactacaca  | dadeedeade  |
|     |      |            |                          |            |            |            |             |
|     |      |            | tatgggtgca<br>tgctttcctg |            |            |            |             |
|     |      |            | tetgeeteee               |            |            |            |             |
| 45  |      |            | aaggccctct               |            |            |            |             |
| 40  |      |            | gactccagag               |            |            |            |             |
|     |      |            | ccaacacaac               |            |            |            |             |
|     |      |            | ctcccctgct               |            |            |            |             |
|     |      |            | cagggcccca               |            |            |            |             |
| 50  |      |            | gagacaggtt               |            |            |            |             |
|     |      |            | tcttttggac               |            |            |            |             |
|     |      |            | attactcctg               |            | Laccougeac |            | 520000009   |
|     | マンロエ | cccaggggcg | accactcery               |            |            |            |             |

- 15 -

Q05586 - Homo sapiens Glutamate [NMDA] receptor subunit zeta 1 precursor

MSTMRLLTLA LLFSCSVARA ACDPKIVNIG AVLSTRKHEQ MFREAVNQAN KRHGSWKIQL NATSVTHKPN AIQMALSVCE DLISSQVYAI LVSHPPTPND HFTPTPVSYT AGFYRIPVLG LTTRMSIYSD KSIHLSFLRT VPPYSHQSSV WFEMMRVYSW NHIILLVSDD HEGRAAQKRL ETLLEERESK AEKVLQFDPG TKNVTALLME AKELEARVII LSASEDDAAT VYRAAAMLNM TGSGYVWLVG EREISGNALR YAPDGILGLQ LINGKNESAH ISDAVGVVAQ AVHELLEKEN 10 ITDPPRGCVG NTNIWKTGPL FKRVLMSSKY ADGVTGRVEF NEDGDRKFAN YSIMNLQNRK LVQVGIYNGT HVIPNDRKII WPGGETEKPR GYQMSTRLKI VTIHQEPFVY VKPTLSDGTC KEEFTVNGDP VKKVICTGPN DTSPGSPRHT VPQCCYGFCI DLLIKLARTM NFTYEVHLVA DGKFGTQERV NNSNKKEWNG MMGELLSGQA DMIVAPLTIN NERAOYIEFS KPFKYOGLTI LVKKEIPRST LDSFMQPFQS TLWLLVGLSV HVVAVMLYLL DRFSPFGRFK VNSEEEEEDA LTLSSAMWFS WGVLLNSGIG EGAPRSFSAR ILGMVWAGFA MIIVASYTAN LAAFLVLDRP EERITGINDP RLRNPSDKFI YATVKQSSVD IYFRRQVELS TMYRHMEKHN YESAAEAIQA VRDNKLHAFI WDSAVLEFEA SQKCDLVTTG ELFFRSGFGI GMRKDSPWKQ NVSLSILKSH ENGFMEDLDK TWVRYQECDS RSNAPATLTF ENMAGVFMLV AGGIVAGIFL IFIEIAYKRH KDARRKOMOL AFAAVNVWRK NLODRKSGRA EPDPKKKATF RAITSTLASS FKRRRSSKDT STGGGRGALQ NQKDTVLPRR AIEREEGQLQ LCSRHRES

SEQ ID NO. 27

25 D13515 Homo sapiens mRNA for key subunit of N-methyl-D-aspartate receptor, complete cds

1 gcttcagcgc cccttccctc ggccgacgtc ccgggaccgc cgctccgggg gagacgtggc 30 61 gtccgcagcc cgcggggccg ggcgagcgca ggacggcccg gaagccccgc gggggatgcg 121 ccgagggccc cgcgttcgcg ccgcgcagag ccaggcccgc ggcccgagcc catgagcacc 181 atgegeetge tgaegetege cetgetgtte teetgeteeg tegeeegtge egegtgegae 241 cccaagatcg tcaacattgg cgcggtgctg agcacgcgga agcacgagca gatgttccgc 301 gaggccgtga accaggccaa caagcggcac ggctcctgga agattcagct caatgccacc 361 teegteaege acaageeeaa egecateeag atggetetgt eggtgtgega ggaceteate 421 tecagecagg tetaegecat cetagttage catecaceta eccecaaega ceaetteaet 481 cccaccctg tetectacae ageoggette tacegeatae ccgtgetggg getgaccace 541 cgcatgtcca tctactcgga caagagcatc cacctgagct tcctgcgcac cgtgccgccc 601 tactcccacc agtccagcgt gtggtttgag atgatgcgtg tctacagctg gaaccacatc 40 661 atcctgctgg tcagcgacga ccacgagggc cgggcggctc agaaacgcct ggagacgctg 721 ctggaggagc gtgagtccaa ggcagagaag gtgctgcagt ttgacccagg gaccaagaac 781 gtgacggccc tgctgatgga ggcgaaagag ctggaggccc gggtcatcat cctttctgcc 841 agegaggaeg atgetgeeae tgtatacege geageegega tgetgaacat gaegggetee 901 gggtacgtgt ggctggtcgg cgagcgcgag atctcgggga acgccctgcg ctacgcccca 45 961 gacggcatec tegggetgea geteateaae ggcaagaaeg agteggeeca cateagegae 1021 gccgtgggcg tggtggccca ggccgtgcac gagetcctcg agaaggagaa catcaccgac 1081 ccgccgcggg gctgcgtggg caacaccaac atctggaaga ccgggccgct cttcaagaga 1141 gtgctgatgt cttccaagta tgcggatggg gtgactggtc gcgtggagtt caatgaggat 1201 ggggaccgga agttcgccaa ctacagcatc atgaacctgc agaaccgcaa gctggtgcaa 1261 gtgggcatct acaatggcac ccacgtcatc cctaatgaca ggaagatcat ctggccaggc 1321 ggagagacag agaagceteg agggtaccag atgtecacca gactgaagat tgtgacgate 1381 caccaggage ecttegtgta egteaagece aegetgagtg atgggacatg caaggaggag 1441 ttcacagtca acggcgaccc agtcaagaag gtgatctgca ccgggcccaa cgacacgtcg 1501 ccgggcagcc cccgccacac ggtgcctcag tgttgctacg gcttttgcat cgacctgctc 1561 atcaagctgg cacggaccat gaacttcacc tacgaggtgc acctggtggc agatggcaag

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1741 gegeagtaca tegagtitte caageeette aagtaceagg geetgaetat tetggteaag
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2281 cggcatatgg agaagcacaa ctacgagagt gcggcggagg ccatccaggc cgtgagagac
2341 aacaagetgc atgccttcat ctgggactcg gcggtgctgg agttcgaggc ctcgcagaag
2401 tgcgacctgg tgacgactgg agagctgttt ttccgctcgg gcttcggcat aggcatgcgc
2461 aaagacagcc cctggaagca gaacgtctcc ctgtccatcc tcaagtccca cgagaatggc
2521 ttcatggaag acctggacaa gacgtgggtt cggtatcagg aatgtgactc gcgcagcaac
2581 gcccctgcga cccttacttt tgagaacatg gccggggtct tcatgctggt agctgggggc
2641 ategtggeeg ggatetteet gatttteate gagattgeet acaageggea caaggatget
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2761 gatagaaaga gtggtagagc agagcctgac cctaaaaaga aagccacatt tagggctatc
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3061 ccacgcagag ccccggagca ccacggggtc gggggaggag cacccccag
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30 LLTLLALLFSCSVAR

SEQ ID NO. 29

35 ITMLCTGSRTLK

SEQ ID NO. 30

40 ITHU and P01009 - Homo sapiens α-1-antitrypsin precursor

mpssvswgil llaglcclvp vslaedpqgd aaqktdtshh dqdhptfnki tpnlaefafs lyrqlahqsn stniffspvs iatafamlsl gtkadthdei leglnfnlte ipeaqihegf qellrtlnqp dsqlqlttgn glflseglkl vdkfledvkk lyhseaftvn fgdteeakkq indyvekgtq gkivdlvkel drdtvfalvn yiffkgkwer pfevkdteee dfhvdqvttv kvpmmkrlgm fniqhckkls swvllmkylg nataifflpd egklqhlene lthdiitkfl enedrrsasl hlpklsitgt ydlksvlgql gitkvfsnga dlsgvteeap lklskavhka vltidekgte aagamfleai pmsippevkf nkpfvflmie qntksplfmg kvvnptqk

SEQ ID NO. 31

NM 000295

Homo sapiens serine (or cysteine) proteinase inhibitor, clade A(alpha-1 antiproteinase, antitrypsin), member 1 (SERPINA1), transcript variant 1, mRNA

```
5
         1 aatgactcct ttcggtaagt gcagtggaag ctgtacactg cccaggcaaa gcgtccgggc
        61 agogtaggog ggcgactcag atcccagcca gtggacttag cccctgtttg ctcctccgat
       121 aactggggtg accttggtta atattcacca gcagcctccc ccgttgcccc tctggatcca
      T81 ctgcttaaat acggacgagg acagggccct gtctcctcag cttcaggcac caccactgac
       241 ctgggacagt gaatcgacaa tgccgtcttc tgtctcgtgg ggcatcctcc tgctggcagg
10
       301 cctgtgctgc ctggtccctg tctccctggc tgaggatccc cagggagatg ctgcccagaa
       361 gacagataca teccaecatg atcaggatea eccaacette aacaagatea eccecaacet
       421 ggctgagttc gccttcagcc tataccgcca gctggcacac cagtccaaca gcaccaatat
       481 ettettetee ceagtgagea tegetacage etttgeaatg eteteeetgg ggaecaagge
       541 tgacactcac gatgaaatcc tggagggcct gaatttcaac ctcacggaga ttccqqaqqc
15
      601 tragatricat gaaggetter aggaarteet regtarrete aarcagerag arageraget
       661 ccagetgace accggcaatg geetgtteet cagegaggge etgaagetag tggataagtt
       721 tttggaggat gttaaaaagt tgtaccactc agaagccttc actgtcaact tcqqqqacac
       781 cgaagaggcc aagaaacaga tcaacgatta cgtggagaag ggtactcaag ggaaaattgt
      841 ggatttggtc aaggagettg acagagacac agtttttgct ctggtgaatt acatcttctt
20
      901 taaaggcaaa tgggagagac cetttgaagt caaggacace gaggaagagg acttccacgt
      961 ggaccaggtg accaccgtga aggtgcctat gatgaagcgt ttaggcatgt ttaacatcca
     1021 gcactgtaag aagctgtcca gctgggtgct gctgatgaaa tacctgggca atýccaccgc
     1081 catcttcttc ctgcctgatg aggggaaact acagcacctg gaaaatgaac tcaccacga
     1141 tatcatcacc aagtteetgg aaaatgaaga cagaaggtet gecagettac atttacccaa
25
     1201 actgtccatt actggaacct atgatctgaa gagcgtcctg ggtcaactgg gcatcactaa
    1261 ggtcttcagc aatggggctg accteteegg ggtcacagag gaggcaeece tgaagetete
     1321 caaggccgtg cataaggctg tgctgaccat cgacgagaaa gggactgaag ctgctggggc
     1381 catgttttta gaggccatac ccatgtctat ccccccgag gtcaagttca acaaaccctt
     1441 tgtcttctta atgattgaac aaaataccaa gtctcccctc ttcatgggaa aagtggtgaa
     1501 teccaeccaa aaataaetge etetegetee teaacceete eeetecatee etggeeecet
     1561 ccctggatga cattaaagaa gggttgaget ggtccctgcc tgcaaaa
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# SEQ ID NO. 32

K02212

35

Human alpha-1-antitrypsin gene (S variant), complete cds

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1 gaattecagg ttggaggggc ggcaacetec tgccagcett caggccacte tcctgtgcct
40
        61 gccagaagag acagagettg aggagagett gaggagagea ggaaaggtgg aacattgetq
      121 ctgctgctca ctcagttcca caggtgggag gaacagcagg gcttagagtg ggggtcattg
      181 tgcagatggg aaaacaaagg cccagagagg ggaagaaatg cctaggagct accgagggca
      241 ggcgacctca accacagccc agtgctggag ctgtgagtgg atgtagagca gcggaatatc
      301 cattcageca getcagggga aggacagggg ceetgaagec aggggatgga getgeaggga
45
      361 agggagetea gagagaaggg gaggggagte tgageteagt tteeegetge etgaaaggag
      421 ggtggtacct actcccttca cagggtaact gaatgagaga ctgcctggag gaaagctctt
      481 caagtgtggc ccaccccacc ccagtgacac cagcccctga cacgggggag ggagggcagc
      541 atcaggaggg getttetggg cacacceagt acceptetet gagettteet tgaactgttg
      601 cattttaatc ctcacagcag ctcaacaagg tacataccgt caccatcccc attttacaga
50
      661 tagggaaatt gaggetegga geggttaaac aacteacetg aggeeteaca gecagtaagt
      721 gggttccctg gtctgaatgt gtgtgctgga ggatcctgtg ggtcactcgc ctggtagagc
      781 cccaaggtgg aggcataaat gggactggtg aatgacagaa ggggcaaaaa tgcactcatc
      841 cattcactct gcaagtatct acggcacgta cgccagctcc caagcaggtt tgcgggttgc
      901 acageggage gatgeaatet gatttagget tttaaaggat tgeaateaag tgggaeeeae
55
      961 tagecteaac cetgtacete cecteceete cacceccage agtetecaaa ggeetecaae
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|     | 1001 |            | +                        |            |             |            |            |
|-----|------|------------|--------------------------|------------|-------------|------------|------------|
|     | 1021 | aaccccagag | tgggggccat               | gtatccaaag | aaactccaag  | ctgtatacgg | atcacactgg |
|     | 1081 | ttttccagga | gcaaaaacag               | aaacagcctg | aggetggtea  | aaattgaacc | tectectget |
|     | 1141 | ctgagcagcc | tagggggcag               | actaagcaga | gggctgtgca  | gacccacata | aagagcctac |
| 5   | 1201 | tgtgtgccag | gcacttcacc               | cgaggcactt | cacaagcatg  | cttgggaatg | aaacttccaa |
| 5   |      |            | tgcaggtgaa               |            |             |            |            |
|     | 1321 | cagcacagct | cttctttaca               | gargractic | cccacctcta  | ccctgtctca | cggcccccca |
|     | 1381 | tgccagcctg | acggttgtgt               | ctgcctcagt | catgctccat  | ttttccatcg | ggaccatcaa |
|     | 1441 | gagggtgttt | gtgtctaagg               | ctgactgggt | aactttggat  | gagcggtctc | tccgctccga |
| 10  | 1501 | geergrice  | tcatctgtca               | aacgggctct | aacccactct  | gateteccag | ggcggcagta |
| 10  | 1561 | agrerreage | atcaggcatt               | ttggggtgac | tcagtaaatg  | gtagatettg | ctaccagtgg |
|     |      |            | aaggattctg               |            |             |            |            |
|     | 1081 | gactgtetga | ctcacgccac               | ccccccacc  | ttggacacag  | gacgctgtgg | tttctgagcc |
|     | 1/41 | aggtacaatg | actcctttcg               | graagrgcag | tggaagetgt  | acactgccca | ggcaaagcgt |
| 15  | 1801 | eegggeageg | taggcgggcg               | actcagatcc | cagccagtgg  | acttagcccc | tgtttgctcc |
| 15. | 1001 | recgaraact | ggggtgacct               | tggttaatat | reaccageag  | cctccccgt  | tgcccctctg |
|     | 1921 | gatecactge | ttaaatacgg               | acgaggacag | ggccctgtct  | cctcagcttc | aggcaccacc |
|     | 1981 | actyacctgg | gacagtgaat               | cgtaagtatg | cettteaetg  | cgaggggttc | tggagaggct |
|     | 2101 | ceegagecee | ccatggccca               | ggcaggcagc | aggicigggg  | caggagggg  | gttgtggagt |
| 20  | 2101 | gggtateege | ctgctgaggt               | gcagggcaga | tatttagaget | geagetgage | tcctatttc  |
| 20  | 2101 | ataataata  | cagccatgag               | taattaatat | rgitteeeag  | rectgeeegg | tececeteg  |
|     |      |            | gtggatacac               |            |             |            |            |
|     |      |            | caccccagga               |            |             |            |            |
|     |      |            | tttctgtttg               |            |             |            |            |
| 25  |      |            | tcaccacctc<br>aaggttcaga |            |             |            |            |
| 23  |      |            |                          |            |             |            |            |
|     |      |            | accaggaaca<br>tggacctctg |            |             |            |            |
|     |      |            | cagggctcaa               |            |             |            |            |
|     |      |            | gcgtgattaa               |            |             |            |            |
| 30  |      |            | gaggaagatg               |            |             |            |            |
| 50  |      |            | gggctcaggc               |            |             |            |            |
|     |      |            | ctcttgggtc               |            |             |            |            |
|     |      |            | tgatgctcgg               |            |             |            |            |
|     |      |            | aacctttgac               |            |             |            |            |
| 35  |      |            | aggatttaat               |            |             |            |            |
|     |      |            | ggtggccagt               |            |             |            |            |
|     |      |            | tattctcgag               |            |             |            |            |
|     |      |            | acaatagctc               |            |             |            |            |
|     |      |            | ttaagtaact               |            |             |            |            |
| 40  |      |            | cagagccttt               |            |             |            |            |
|     |      |            | tgaagttttc               |            |             |            |            |
|     |      |            | aggttttgga               |            |             |            |            |
|     |      |            | tgtaagcaag               |            |             |            |            |
|     |      |            | ttctatctat               |            |             |            |            |
| 45  |      |            | tagatgatac               |            |             |            |            |
|     |      |            | tgaggctgtg               |            |             |            |            |
|     |      |            | tttaatggaa               |            |             |            |            |
|     |      |            | ctgaaatggt               |            |             |            |            |
|     |      |            | aggagctcaa               |            |             |            |            |
| 50  |      |            | ttacgtcagt               |            |             |            |            |
|     |      |            | agctagtgct               |            |             |            |            |
|     |      |            | cctggtcaca               |            |             |            |            |
|     |      |            | attctcttcc               |            |             |            |            |
|     | 4201 | tcctgggtag | aaatggtgcg               | agattaggca | gggagtggac  | gettecetgt | ccctggcccc |
| 55  |      |            | ctcccacctg               |            |             |            |            |

|    | 4321 | tggtttaaag | cttggcctca   | gtgtccgtac | accatggggt  | ccttggccag | atggcgactt |
|----|------|------------|--------------|------------|-------------|------------|------------|
|    | 4381 | tetectetec | : agtcgccctc | ccaggcacta | gcttttagga  | qtqcaqqqtq | ctacctctaa |
|    | 4441 | tagaagggcc | : aggagagagc | aggttttgga | gacctgatqt  | tataaqqaac | agettagaaa |
|    | 4501 | gcataatgaa | cccaacatga   | tgcttgagac | caatgtcaca  | gcccaattct | gacattcatc |
| 5  | 4561 | atctgagatc | : tgaggacaca | gctgtctcag | ttcatgatct  | gaqtqctqqq | aaaqccaaqa |
|    | 4621 | cttgttccag | ctttgtcact   | gacttgctgt | atagcctcaa  | caaqqccctq | acceteteta |
|    | 4681 | ggcttcaaac | tcttcactgt   | gaaaggagga | aaccagagta  | ggtgatgtga | caccaggaaa |
| -  | 4741 | gatggatggg | tgtgggggaa   | tgtgctcctc | -ccagctgtca | ccccctcqcc | accetecetq |
|    | 4801 | caccagecte | tccacctcct   | ttgagcccag | aattcccctg  | tctaggaggg | cacctatete |
| 10 | 4861 | gtgcctagcc | atgggaattc   | tccatctgtt | ttgctacatt  | gaacccagat | gccattctaa |
|    | 4921 | ccaagaatcc | tggctgggtg   | caggggctct | cgcctgtaac  | cccaqcactt | taggaggcca |
|    | 4981 | aggcaggcgg | atcaagaggt   | caggagttca | agacctgcct  | ggccaacacq | gtgaaacctc |
|    | 5041 | agctctacta | aaaatacaaa   | aattagccag | gcgtggtggc  | acacqcctqt | aatcccaqct |
|    | 5101 | atttgggaag | ctgagacaga   | agaatttctt | gaacccggga  | ggtggaggtt | tcaqtqaqcc |
| 15 | 5161 | gagatcacgc | cactgcactc   | caccctggcg | gataaagcga  | gactctgtct | caaaaaaaac |
|    | 5221 | ccaaaaacct | atgttagtgt   | acagagggcc | ccagtgaagt  | cttctcccag | ccccactttq |
|    | 5281 | cacaactggg | gagagtgagg   | ccccaggacc | agaggattct  | tgctaaaggc | caaqtqqata |
|    | 5341 | gtgatggccc | tgccaggcta   | gaagccacaa | cctctggccc  | tgaggccact | cagcatattt |
|    | 5401 | agtgtcccca | ccctgcagag   | gcccaactcc | ctcctgacca  | ctgagccctq | taatgatggg |
| 20 | 5461 | ggaatttcca | taagccatga   | aggactgcac | aaagttcagt  | tgggagtgaa | agagaaatta |
|    | 5521 | aagggagatg | gaaatataca   | gcactaattt | tagcaccgtc  | ttcagttcta | acaacactag |
|    | 5581 | ctagctgaag | aaaatacaaa   | catgtattat | gtaatgtgtg  | gtctgttcca | tttggattac |
|    | 5641 | ttagaggcac | gagggccaag   | gagaaaggtg | gtggagagaa  | accagetttq | cacttcattt |
|    | 5701 | gttgctttat | tggaaggaaa   | cttttaaaag | tccaaggggg  | ttgaagaatc | tcaatatttq |
| 25 | 5761 | ttatttccag | ctttttttct   | ccagtttttc | atttcccaaa  | ttcaaggaca | cctttttctt |
|    | 5821 | tgtattttgt | taagatgatg   | gttttggttt | tgtgactagt. | agttaacaat | gtggctgccq |
|    | 5881 | ggcatattct | cctcagctag   | gacctcagtt | ttcccatctg  | tgaagacggc | aggttctacc |
|    | 5941 | tagggggctg | caggcaggtg   | gtccgaagcc | tgggcatatc  | tggagtagaa | ggatcactgt |
|    | 6001 | ggggcagggc | aggittctgtg  | ttgctgtgga | tgacgttgac  | tttgaccatt | gctcggcaga |
| 30 | 6061 | gcctgctctc | gctggttcag   | ccacaggccc | caccactccc  | tattgtctca | gccccgggta |
|    | 6121 | tgaaacatgt | attcctcact   | ggcctatcac | ctgaagcctt  | tgaatttgca | acacctgcca |
|    | 6181 | acccctccct | caaaagagtt   | gccctctcta | gatccttttg  | atgtaaggtt | tggtgttgag |
|    | 6241 | acttatttca | ctaaattctc   | atacataaac | atcactttat  | gtatgaggca | aaatgaggac |
|    | 6301 | cagggagatg | aatgacttgt   | cctggctcat | acacetggaa  | agtgacagag | tcagattaga |
| 35 | 6361 | tcctaggtct | atctgaagtt   | aaaagaggtg | tcttttcact  | tcccacctcc | tccatctact |
|    | 6421 | ttaaagcagc | acaaacccct   | gctttcaagg | agagatgagc  | gtctctaaag | cccctgacag |
|    | 6481 | caagagccca | gaactgggac   | accattagtg | acccagacgg  | caggtaagct | gactgcagga |
|    | 6541 | gcatcagcct | attcttgtgt   | ctgggaccac | agagcattgt  | ggggacagcc | ccgtctcttg |
|    | 6601 | ggaaaaaaac | cctaagggct   | gaggatcctt | gtgagtgttg  | ggtgggaaca | gctcccaqqa |
| 40 | 6661 | ggtttaatca | cageceetee   | atgctctcta | gctgttgcca  | ttgtgcaaga | tgcatttccc |
|    | 6721 | ttctgtgcag | cagtttccct   | ggccactaaa | tagtgggatt  | agatagaagc | cctccaaggg |
|    | 6781 | ctccagcttg | acatgattct   | tgattctgat | ctgacccgat  | tctgataatc | gtgggcaggc |
|    | 6841 | ccattcctct | tcttgtgcct   | cattttcttc | ttttgtaaaa  | caatggctgt | accatttqca |
|    | 6901 | tcttagggtc | attgcagatg   | aaagtgttgc | tgtccagagc  | ctgggtgcag | gacctagatg |
| 45 | 6961 | taggattctg | gttctgctac   | ttcctcagtg | acattgaata  | gctgacctaa | tctctctggc |
|    | 7021 | tttggtttct | tcatctgtaa   | aagaaggata | ttagcattag  | cacctcacgg | gattqttaca |
|    | 7081 | agaaagcaat | gaattaacac   | atgtgagcac | ggagaacagt  | gcttggcata | tggtaagcac |
|    | 7141 | tacgtacatt | ttgctattct   | tctgattctt | tcagtgttac  | tgatgtcqgc | aagtacttgg |
|    | 7201 | cacaggctgg | tttaataatc   | cctaggcact | ttcacgtggt  | gtcaatccct | gatcactggg |
| 50 | 7261 | agtcatcatg | tgccttgact   | cgggcctggc | cccccatct   | ctgtcttgca | ggacaatgcc |
|    | 7321 | gtcttctgtc | tcgtggggca   | tectectget | ggcaggcctq  | tgctgcctgq | tecetgtete |
|    | 7381 | cctggctgag | gatccccagg   | gagatgctgc | ccagaagaca  | gatacatccc | accatgatca |
|    | 7441 | ggatcaccca | accttcaaca   | agatcacccc | caacctggct  | gagttcgcct | tcagcctata |
|    | 7501 | ccgccagctg | gcacaccagt   | ccaacagcac | caatatcttc  | ttctccccag | tgagcatcgc |
| 55 | 7561 | tacagccttt | gcaatgctct   | ccctggggac | caaggctgac  | actcacgatg | aaatcctgga |
|    |      |            |              |            |             | - 3        | . 33       |

|    |       | gggcctgaat |            |            |            |            |            |
|----|-------|------------|------------|------------|------------|------------|------------|
|    |       | actcctccgt |            |            |            |            |            |
|    |       | gttcctcagc |            |            |            |            |            |
|    |       | ccactcagaa |            |            |            |            |            |
| 5  | 7861  | cgattacgtg | gagaagggta | ctcaagggaa | aattgtggat | ttggtcaagg | agcttgacag |
|    | 7921  | agacacagtt | tttgctctgg | tgaattacat | cttctttaaa | ggtaaggttg | ctcaaccagc |
|    | 7981  | ctgagctgtt | tcccatagaa | acaagcaaaa | atatttctca | aaccatcagt | tcttgaactc |
|    | 8041  | tccttggcaa | tgcattatgg | gccatagcaa | tgcttttcag | cgtggattct | tcagttttct |
|    | 8101  | acacacaac  | actaaaatgt | tttccatcat | tgagtaattt | gaggaaataa | tagattaaac |
| 10 |       | tgtcaaaact |            |            |            |            |            |
|    | 8221  | gtatatgtag | aatatataat | gcttagaact | atagaacaaa | ttgtaataca | ctgcataaag |
|    | 8281  | ggatagtttc | atggaacata | ctttacacga | ctctagtgtc | ccagaatcag | tatcagtttt |
|    |       | gcaatctgaa |            |            |            |            |            |
|    | 8401  | aatgcattct | acctctttga | ggtgctaatt | tctcatctta | gcatggacaa | aataccattc |
| 15 |       | ttgctgtcag |            |            |            |            |            |
|    |       | atacagcagg |            |            |            |            |            |
|    |       | aatgccaggg |            |            |            |            |            |
|    | 8641  | cagcataggg | gaggggaggt | gggaggcaag | gccaggggct | gcttcctcca | ctctgaggct |
|    | 8701  | cccttgctct | tgaggcaaag | gagggcagtg | gaggcaagcc | aggctgcagt | cagcacagct |
| 20 | 8761  | aaagtcctgg | ctctgctgtg | gccttagtgg | gggcccaggt | ccctctccag | ccccagtctc |
|    |       | ctccttctgt |            |            |            |            |            |
|    |       | atgcctcgat |            |            |            |            |            |
|    |       | ttcccctgcc |            |            |            |            |            |
|    |       | ctggatgaat |            |            |            |            |            |
| 25 |       | aaatatgcct |            |            |            |            |            |
|    |       | atgattccaa |            |            |            |            |            |
|    |       | tagaaattct |            |            |            |            |            |
|    |       | tggatggtca |            |            |            |            |            |
|    |       | cgtcaagggg |            |            |            |            |            |
| 30 |       | cttccaaacc |            |            |            |            |            |
|    |       | agagaccctt |            |            |            |            |            |
|    |       | ccgtgaaggt |            |            |            |            |            |
|    | 9541  | tgtccagctg | ggtgctgctg | atgaaatacc | tgggcaatgc | caccgccatc | ttcttcctgc |
|    |       | ctgatgaggg |            |            |            |            |            |
| 35 | 9661  | tcctggaaaa | tgaagacaga | aggtgattcc | ccaacctgag | ggtgaccaag | aagctgccca |
|    | 9721  | cacctcttag | ccatgttggg | actgaggccc | atcaggactg | gccagagggc | tgaggagggt |
|    |       | gaaccccaca |            |            |            |            |            |
| •  |       | ccactgagtt |            |            |            |            |            |
|    | 9901  | ggtaaaggtc | tegtecetgg | gaacttccca | ctccagtgtg | gacactgtcc | cttcccaata |
| 40 | 9961  | tccagtgccc | aaggcaggga | cagcagcacc | accacacgtt | ctggcagaac | caaaaaggaa |
|    | 10021 | cagatgggct | tcctggcaaa | ggcagcagtg | gagtgtggag | ttcaagggta | gaatgtccct |
| ,  | 10081 | ggggggacgg | gggaagagcc | tgtgtggcaa | ggcccagaaa | agcaaggttc | ggaattggaa |
|    |       | cagccaggcc |            |            |            |            |            |
|    |       | ttgggtgtcc |            |            |            |            |            |
| 45 | 10261 | attcgtgatt | atgcccatgc | cctgctgatc | tagttcgttt | tgtacactgt | aaaaccaaga |
|    |       | tgaaaataca |            |            |            |            |            |
|    |       | tgccagcacc |            |            |            |            |            |
|    |       | gtaacggatc |            |            |            |            |            |
|    | 10501 | attgtctccc | catggaaaac | cagagaggag | cactcagcct | ggtgtggtca | ctcttctctt |
| 50 |       | atccactaaa |            |            |            |            |            |
|    | 10621 | ccctggggat | gttacaggct | gggggccagg | tgacccaaca | ctacagggca | agatgagaca |
|    |       | ggcttccagg |            |            |            |            |            |
|    |       | gatgttaaca |            |            |            |            |            |
|    |       | ttcccatctt |            |            |            |            |            |
| 55 | 10861 | aacacttgca | ctgtggtggg | tcccagaaga | acaagaggaa | tgctgtgcca | tgccttgaat |

```
10921 ttettttetg cacgacaggt etgecagett acatttacce aaactgteca ttactggaae
    10981 ctatgatctg aagagegtee tgggteaact gggeateact aaggtettea geaatgggge
    11041 tgacctctcc ggggtcacag aggaggcacc cctgaagctc tccaaggtga gatcaccctg
    11101 acgaecttgt tgcaccatgg tatctgtagg gaagaatgtg tgggggctgc agcactgtcc
    11161 tgaggctgag gaaggggccg agggaaacaa atgaagaccc aggctgagct cctgaagatg
    11221 cccgtgattc actgacacgg gacggtgggc aaacagcaaa gccaggcagg ggctgctgtg
    11281 cagctggcac tttcggggcc tcccttgagg ttgtgtcact gaccctgaat ttcaactttg
    11341 cccaagacct tctagacatt gggccttgat ttatccatac tgacacagaa aggtttgggc
    11401 taagttgttt caaaggaatt tetgaeteet tegatetgtg agatttggtg tetgaattaa
    11461 tgaatgattt cagctaaagt gacacttatt ttggaaaact aaaggcgacc aatgaacaac
    11521 ctgcagttcc atgaatggct gcattatctt ggggtctggg cactgtgaag gtcactgcca
    11581 gggtccgtgt cctcaaggag cttcaagccg tgtactagaa aggagagagc cctggaggca
    11641 gacgtggagt gacgatgctc ttccctgttc tgagttgtgg gtgcacctga gcagggggag
    11701 aggcgcttgt caggaagatg gacagaggg agccagcccc atcagccaaa gccttgagga
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    11761 ggagcaaggc ctatgtgaca gggagggaga ggatgtgcag ggccagggcc gtccaggggg
    11821 agtgagcgct tcctgggagg tgtccacgtg agccttgctc gaggcctggg atcagcctta
    11881 caacgtgtct ctgcttctct cccctccagg ccgtgcataa ggctgtgctg accatcgacg
    11941 agaaagggac tgaagctgct ggggccatgt ttttagaggc catacccatg tctatccccc
    12001 ccgaggtcaa gttcaacaaa ccctttgtct tcttaatgat tgaacaaaat accaagtctc
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    12061 ccctcttcat gggaaaagtg gtgaatccca cccaaaaata actgcctctc gctcctcaac
    12121 ccctccctc catccctggc cccctccctg gatgacatta aagaagggtt gagctggtcc
    12181 ctgcctgcat gtgatctgta aatccctggg atgttttctc tg
```

gi/125294, P12277 - Homo sapiens Creatine kinase, B chain (B-CK)

mpfsnshnal klrfpaedef pdlsahnnhm akvltpelya elrakstpsg ftlddviqtg vdnpghpyim tvgcvagdee syevfkdlfd piiedrhggy kpsdehktdl npdnlqggdd ldpnyvlssr vrtgrsirgf clpphcsrge rraieklave alssldgdla gryyalksmt eaeqqqlidd hflfdkpvsp lllasgmard wpdargiwhn dnktflvwvn eedhlrvism qkggnmkevf trfctgltqi etlfkskdye fmwnphlgyi ltcpsnlgtg lragvhiklp nlgkhekfse vlkrlrlqkr gtggvdtaav ggvfdvsnad rlgfsevelv qmvvdgvkll iemeqrlegg qaiddlmpaq k

SEQ ID NO. 34

40

NM\_001823 Homo sapiens creatine kinase, brain (CKB), mRNA Creatine kinase, B chain (B-CK)

```
1 gctgttcgcc tgcgtcgcc cgggagetgc cgacggacgg agcgccccg ccccgcccg
45 61 gccgccgcc cgccgccgc atgcccttct ccaacagcca caacgcactg aagctgcgct
121 tcccggccga ggacgagttc cccgacctga gcgcccacaa caaccacatg gccaaggtgc
181 tgacccccga gctgtacgcg gagctgcgcg ccaagagcac gccgagcggc ttcacgctgg
241 acgacgtcat ccagacaggc gtggacaacc cgggccaccc gtacatcatg accgtgggct
301 gcgtggcggg cgacgaggg tcctacgaag tgttcaagga tctcttcgac cccatcatcg
361 aggaccggca cggcggctac aagcccagcg atgagcacaa gaccgacctc aaccccgaca
421 acctgcaggg cggcgacgac ctggacccca actacgtgct gagctcgcgg gtgcgcacgg
481 gccgcagcat ccgtggcttc tgcctcccc cgcactgcag cggcgggag cgccggcca
541 tcgagaagct cgcggtgaa gccctgtcca gcctggacgg cgacctggcg
601 acgcgctcaa gagcatgacg gaggcggac agcagcact catcgacgac tggcccgacg
556 661 tcgacaagcc cgtgtcgcc ctgctgctg cctcgggcat ggcccgcgac tggcccgacg
```

- 22 -

```
721 cccgcggtat ctggcacaat gacaataaga ccttcctggt gtgggtcaac gaggaggacc
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901 accctcacct gggctacatc ctcacctgcc catccaacct gggcaccggg ctgcgggcag
961 gtgtgcatat caagctgcc aacctgggca agcatgaaa gttctcggag gtgcttaagc
1021 ggctgcgact tcagaagcga ggcacaggcg gtgtggacac ggctgcggtg ggcggggtct
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1201 acgacctcat gcctgccag aaatgaagcc cggcccacac ccgacaccag ccctgctgct
1261 tcctaactta ttgcctggc agtgccacc atgcaccct gatgttcgcc gtctggcgg
1321 cccttagcct tgatgctgaa acttccgtca cccttggtag agtttatttt tttgatggct
1381 aagatactgc tgatgctgaa ataaactagg gttttggcct gcctgcgtct g
```

#### 15 SEQ ID NO. 35

#### X15334

Human gene for creatine kinase B (EC 2.7.3.2).

```
1 gatcagtttt tttttttaat cgcacttatg cttattgttt attagcgttt cctcccatct
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      61 ttgcctgaag tctccgggga ctgcctttgg gggtcgggta aacttgtccc ctgcgaagag
     121 ggcccagggt tggggtctgg aaactccgag gctgcacttg ccagcggcct cttaaggcca
     181 cagcgtcccc gtggtttctg gctcgcagcc ccccgagacc caggacttgt ccaaggtcag
     241 ggcaccgegg gtgccccegg gctgggecgc agcagactgc gcttcccgcg cgccttcgct
     301 ttgcaccagg atcgcccagg aaatgcctgc gggcaccttg aggaaggtcg gcggctccgg
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     361 gccagctcgc actggccggg gtggggcggg ggccgtacct gctgcggaag ccccgaaagc
     481 gatgcggatg aacccaageg teetegagtg eeeggagget eteegeetea gttteeegee
     541 cagaggcaag ggcgtgcgag gggatccaga tatccaagga cctgaggttt cggcctcgag
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     601 gtettgggeg ggggaetggg eaggetgege ggggteecag egaggggaea getegggtgg
     661 geggeeaggg tgttggggge tgegggegge ggacaaageg geggeaceae ceegeggege
     721 gggccaatgg aatgaatggg ctataaatag ccgccaatgg gcggcccgcg ttgtgcccct
     781 taagageege gggagegegg ageggeeget gttegeetge gtegeteegg gagetgeega
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     961 ggaccggccg ggggtccccg gcgatgatgg cgctccccgc gcgcgctgcg gaccccgctg
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    1081 gggagccegg gaacccegge gtgceggtcc cetetgacec egegtetece egeagceege
    1141 cgccgccatg cccttctcca acagccacaa cgcactgaag ctgcgcttcc cggccgagga
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    1201 cgagttcccc gacctgagcg cccacaacaa ccacatggcc aaggtgctga cccccgagct
    1261 gtacgeggag etgegegea agageaegee gageggette aegetggaeg aegteateea
    1321 gacaggegtg gacaaccegg gtacgegace ceteggggee ggggteeegg eccecetee
    1381 ccccgcgcag ccgcagggtc ctcagcagcg cgctcgggcc cggcagtgac gtcactgtcc
    1441 ccgtcccgcg ccccctcccc caggccaccc gtacatcatg accgtgggct gcgtggcggg
    1501 cgacgaggag tcctacgaag tgttcaagga tcttttcgac cccatcatcg aggaccggca
    1561 cggcggctac aagcccagcg atgagcacaa gaccgacetc aaccccgaca acctgcaggt
    1621 geggggetge gggegggeeg ggegggeggg geeggggtet tegggegete acteeegtet
    1681 cgcctcccag ggcggcgacg acctggaccc caactacgtg ctgagctcgc gggtgcgcac
    1741 gggccgcagc atccgtggct tetgcctccc cccgcactgc agecgcgggg agegccgagc
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    1801 catcgagaag ctcgcggtgg aaggtagggg ccgggcggcc cgaggggcgg cggcggccgc
    1861 gtcccctcc cggcgcggtc cccgcccgct tttgtttacg tcgcccggga gcggcagccg
    1921 ccgtcgcgct cttatctgcg cgcgcccggg ttcagtttcc cggacccacc gagggacgga
    1981 ggcccagccc ccgcgcccac agcggcctgg ggcccaggga gggcgggtcc tggcgcgggg
    2041 tcaccgcctg ggaccgtcgc ccgggccgtg aggactggac gcccgcagat ccgggcgggt
    2101 ggggccctct gacgtccccc gaggtggggc acggggcgg gcgggtccgc gctgcgggct
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```

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2161 ggaggggggg gegegggage ecagegteet gagegeacee etegeageee tgtecageet
     2221 ggacggcgac ctggcgggcc gatactacgc gctcaagagc atgacggagg cggagcagca
     2281 gcageteate gaegaeeact teetettega caageeegtg tegeeectge tgetggeete
     2341 gggcatggcc cgcgactggc ccgacgcccg cggtatctgg tgcgtgtccc tctgcgccct
     2401 ctcgcggcgt cctccctccc cgctacctcc gctttccctc tcgcccccct cgcgggggtg
     2521 tgggttccgt gccgcgcctc ctcctgcgcc ggtgaccttg gccgagcagg tgcgttaagg
     2581 gactgggccc cggcccgtgg gggctcagga ctcagcaaca cctccccace-ccgagacgtg
     2641 aggtgggggc ggggctctct ggcgcctctc cccgacggcc ctgggagctg gagctctttg
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    2821 ctggccccgc cccacctcgg gccacagcgc atgatggcag ctggggttct cctgctgtga
    2881 ggcgtcccgg ttcccccgcc cgccccgtgt tggcgggtgg agtcttggca gcagcctcca
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    3001 cggcctgggg cttttttctg ggtatgccct gagaccagcc ctcccgcagg cacaatgaca
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    3061 ataagacett eetggtgtgg gteaacgagg aggaceaeet gegggteate tecatgeaga
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    3181 ggacggggca ggcccagacc ccagggcccc agcagggatg tgggtgcccc agcatcagtc
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    3301 teteceteat accetettet eegtetgeag attgaaacte tetteaagte taaggactat
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    3361 gagtteatgt ggaaceetea cetgggetae atecteaeet geecateeaa eetgggeaee
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    3481 gaggtgetta ageggetgeg aetteagaag egaggeaeag gtgageaggg eaggtgetge
    3541 ggcttcccgt ggcctttggg cagccctgtt tcctccgccc tgacttgctg tctccccagg
25
    3601 cggtgtggac acggctgcgg tgggcggggt cttcgacgtc tccaacgctg accgcctggg
    3661 cttctcagag gtggagctgg tgcagatggt ggtggacgga gtgaagctgc tcatcgagat
    3721 ggaacagcgg ctggagcagg gccaggccat cgacgacctc atgcctgccc agaaatgaag
    3781 cccggcccac acccgacace agccctgctg cttcctaact tattgcctgg gcagtgccca
    3841 ccatgcaccc ctgatgttcg ccgtctggcg agcccttagc cttgctgtag agacttccgt
    3901 caccettggt agagtttatt tttttgatgg ctaagatact getgatgetg aaataaacta
    3961 gggttttggc ctgcctgcgt ctgagtggtg cctctccttt cccagggggg agggggaagg
    4021 gcagcagcca ggccccagga gtcttgagtc ctgggcctgc tgtgggcctc gccttctgtg
    4081 agatgggaca agagccagga ggtggccact ctgttctgcc tgccctacct agtccatggg
    4141 ccccttccct cgtgtctatc gggctgtgca ggcaggaaca tgggagagag cgagggagga
35
```

P14618 - Homo sapiens
40 Pyruvate kinase M1 or M2 isozyme

```
mskphseagt afiqtqqlha amadtflehm crldidsppi tarntgiict igpasrsvet lkemiksgmn varlnfshgt heyhaetikn vrtatesfas dpilyrpvav aldtkgpeir tglikgsgta evelkkgatl kitldnayme kcdenilwld yknickvvev gskiyvddgl islqvkqkga dflvteveng gslgskkgvn lpgaavdlpa vsekdiqdlk fgveqdvdmv fasfirkasd vhevrkvlge kgknikiisk ienhegvrrf deileasdgi mvargdlgie ipaekvflaq kmmigrcnra gkpvicatqm lesmikkprp traegsdvan avldgadcim lsgetakgdy pleavrmqhl iareaeaaiy hlqlfeelrr lapitsdpte atavgaveas fkccsgaiiv ltksgrsahq varyrprapi iavtrnpqta rqahlyrgif pvlckdpvqe awaedvdlrv nfamnvgkar gffkkgdvvi vltgwrpgsg ftntmrvvpv p
```

SEQ ID NO. 37

55 X56494

# H.sapiens M gene for M1-type and M2-type pyruvate kinase

```
1 ggtcttcaca ttttgaatge gcaacattgt atetgtgaat gaaggcaaga gttaacagct
        61 gtttaattga taactgctcg catcattagt tgctggctaa caactgggaa atcagaaaat
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       121 gtcttgtaga aaaatgtaag aaaagttcca acaatactga cttaaacacg agcaaaggtg
       181 aaaacagaaa tgctgactcc tgcataggtt atcggcccta atgttctgac ttgatatttc
       241 cagatgocca getetgeget aatateaaca eegtetattt aetttetaet etgaggeatt
       301 cgctctgcag gattccagac cctactaaat tattcacatg gccccaaccg gtccttcctt
       361 gttccgcggt cctaacacaa tgaatggtcc taagaggaaa acggcctcgg ctcccgctcc
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       421 aggeceactt egeagteect agtteteect aetgeegete eagtgeeaga geceeteega
       481 aggeggeeag gaeeteeaae eaegeaeaag tetgeagete teeecaaett teegtteage
       541 tcagtctccg agggtgcgcc agagcagaca cccggaggag tggggagtgg cagggcgggg
       601 ccgggagaat gctgccccgg aacccataaa ttcggccctg cccaggtagg ccgggacagc
       661 tggggtggcc tgggccgaga gccaagaaaa gagaccccat ctggacgccc aacttggcgg
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       721 caacaggtgg ccggcgccg ggggtctggg aggaaagtcg ctccgggggg gcccgttgc
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      1261 taaccacttc tcagtcttac cactctcttt caatttgtct cgacccagga cctcagcagc
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      1381 agccatggct gacacattcc tggagcacat gtgccgcctg gacattgatt caccacccat
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      1501 aaaagggett catgggeagt gacettiete teetgaaaag ageteeatge actttttaaa
      1561 gacttttgag ctatttggga gaggaaaaat tttcagggaa aaaaattctt taaacttaaa
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      1681 taataggccc agetteeega teagtggaga egttgaagga gatgattaag tetggaatga
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   . 2221 gtggctggac tacaagaaca tctgcaaggt ggtggaagtg ggcagcaaga tctacgtgga
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     2521 ccaggatctg aagtttgggg tcgagcagga tgttgatatg gtgtttgcgt cattcatccg
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|    |               |            |             |            |             |                          | •            |
|----|---------------|------------|-------------|------------|-------------|--------------------------|--------------|
|    | 3181          | agaagccccc | gcccactcgg  | gctgaaggca | gtgatgtggc  | caatgcagtc               | ctggatggag   |
| -  | 3241          | ccgactgcat | catgctgtct  | ggagaaacag | ccaaagggga  | ctatectetg               | gaggctgtgc   |
|    | 3301          | gcatgcagca | cctggtgagt  | tctgggcctg | ccccatcccc  | cagggetteg               | gactgggcct   |
| _  | 3361          | gggatggatg | caagctctgg  | tgcagagctt | tttaggtttc  | tccatcctct               | tatqcacaqc   |
| 5  | 3421          | ctttcattat | cctccaagtt  | acagcagcaa | gagggtgggg  | gtggaagtgg               | aggtggcttt   |
|    | 3481          | tttttttct  | cctgttcctg  | cattcctgcc | cacaccccca  | cccctctcat               | ttccttctqc   |
|    | 3541          | tctggaggca | cctccttcat  | tggacaccac | acagtttatt  | tcacttctga               | cttcaaqqtt   |
|    | 3 <u>6</u> 01 | gtgaattctt | cccatggctt  | aagtcctggg | atacttctgc  | -agtgaa <del>agg</del> a | ggtcttgtac   |
|    | 3661          | ctcttcctca | gagtcagaag  | ttctgagtac | ctttgcccta  | ttctgaaaag               | ggctaggggc   |
| 10 | 3721          | tcctgctccc | agctgccctc  | ttcctttggc | ttccaattca  | gttccctctg               | ccccqcatcc   |
|    | 3781          | tgcagacagg | cgctcccgca  | gggggccctt | gtggacctgc  | actggagtct               | gttgccttca   |
|    | 3841          | ctgagctgcc | tgtgctggcc  | ttgcatggtg | cctgtagggg  | gatttgcttt               | gctgtgccat   |
|    | 3901          | tggggtacag | ctgctgctct  | tactctagac | caaaaagtcg  | ggttgagtga               | ctggtggcag   |
|    | 3961          | ggccaagata | gagacagcgg  | ggagggtggc | tgaccctggc  | ggccctggac               | tgagcgtctg   |
| 15 | 4021          | gaggagtcgt | ggaggctctt  | tcccttcttt | ctcctctgag  | agctcgttct               | tcaggctctt   |
|    | 4.081         | ccagcttgtc | atgtcgagtg  | cctggccact | gctcagggtt  | ggaggctcag               | tccctttgcc   |
|    | 4141          | ctgtctgttc | cagctctgga  | gctaactcag | ggatccctga  | tcagggttac               | gtaggtttgg   |
|    | 4201          | taaaatgagt | gctggaaatt  | aactttctcc | cagtagtctt  | aggtctagct               | cagtgaactt   |
|    | 4261          | aaactttatc | cagatatggt  | ttttccttca | gcctttctat  | tccctttcta               | gccagtgaaa   |
| 20 | 4321          | gacccgctgc | cctttgacct  | cagccccctc | caagccccca  | agtttaaaac               | gccaccccct   |
|    | 4381          | gccaccagaa | aaaacagaaa  | aaaaaaaaa  | aaaaaaact   | aaaacaccca               | tctggtctgg   |
|    | 4441          | gcatcttcct | tcctttttca  | ctatgtatcc | tgttactggg  | cttaaacagc               | tttcagagaa   |
|    | 4501          | gagatgtcat | ttctattaaa  | tgctctttca | gtagcgaact  | gagttcacac               | ttgactaagg   |
| 25 | 4561          | atattttccg | gactgtctgt  | catcagcatc | cttagtgggt  | ttccccatat               | ttaaattggt   |
| 25 | 4621          | agaggccagg | gatggtggct  | cacacctgta | atctcagtac  | tttgggaggc               | caaggtaggt   |
|    | 4681          | ggattgcttg | agctcagaag  | accagectgg | gcaacctggt  | gaaaccctgt               | ctctactaaa   |
|    | 4741          | aattcaagtt | agctagctgg  | gcatggtgat | gcacttctgt  | agtcccagct               | acttggagag   |
|    | 4801          | ggggtggtgc | Eggggcagca  | ggatcgctta | aacccaggag  | gttaaggttg               | cagtcagcca   |
| 20 | 4861          | agatggtace | agcctaggtg  | acaaagtgac | accetgtete  | aaaaaagaaa               | ccaaacaaac   |
| 30 | 4921          | ataaaaaaa  | aaacaaaaa   | atcggtagag | agtgatttct  | ctcccaggcc               | cacttaatgt   |
|    | 4981          | agactgggcc | tggctgacac  | ctcaccattc | gtgtgatgtg  | attgctgttc               | tgatgcttag   |
|    | 5041          | atactettgg | cgcagtctca  | caattgccac | catggtagga  | aggtgtccag               | gagacggtgc   |
|    | 5101          | accttgaacc | agtcaccact  | aaagtggctg | cctttctggg  | tctctccaca               | cateceetet   |
| 35 | 2191          | ctctaatttc | cctacttaat  | cgtgtgactt | catggtctca  | aaggaggaac               | agaggctgat   |
| 33 | 5221          | cttgacttag | atatactgaa  | ccatgaaatc | actgcataga  | atgtggggac               | ttgaatgtgt   |
|    | 5281          | cttigggcaa | gtcatttaac  | ctcttaagac | ctcatctgta  | aaatggatta               | gatatgttta   |
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| 40 | 2461          | gecaataaag | cctgggtttg  | aatctaggtc | tactgcctcc  | aaagccagtc               | tteteteetg   |
| 40 | 5521          | caacatcatg | ctctgtctag  | caggagatga | gaacaggtct  | ccatttggag               | cctgtcagtg   |
|    | 2281          | gggteagaga | ctaagattca  | ggctcagggt | ctaaattccg  | tateettet                | tccataccct ' |
|    | 2041          | ggegeeeee  | acgaacagat  | agacacttta | gggctgcaag  | gtttggattg               | catggcactg   |
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| 73 | 5001          | contatatat | catattacta  | atgeagetta | rgacccataa  | ctaagagcag               | taccaggtat   |
|    | 2001          | ggetetgttt | t           | teceetgtee | tetgggetge  | atgcattccg               | ttcttacaga   |
|    | 6001          | aagaatatta | ccacccage   | acatectgee | acacatetge  | ttctactgtg               | aaattgatga   |
|    | 6061          | antactatta | cegatteette | cereteceat | catttactga  | gatgctggtg               | attgcattat   |
| 50 | 6121          | aactecetta | agettaeatt  | gcccccccga | ttettggtet  | tatctgagca               | agtgatctat   |
| 50 | 6101          | ttaaatatat | graggererer | catgactgtt | ctaaccacca  | gattttaatc               | aagtgtctta   |
|    | 6241          | totcacaact | taggaggaga  | taaattaaaa | teachtest   | acatggctgt               | cagtgtgcc    |
|    | 6301          | accoctcctc | aatotottaa  | categorass | eattern = = | tggctttgac               | ceagetttee   |
|    | 6361          | taaaaaaaaa | tanagatan   | catggcaggc | carrygaaag  | gctcagttca               | recedtee     |
| 55 | 6471          | caaccaacaa | tatasassas  | anagacetat | yearggaggc  | tgggcaggag               | cctgcctaat   |
| JJ | 0467          | caaccaycca | rgrgaggagg  | gagggeetgt | recttectgt  | aagctatgtc               | argaggcagc   |

|    | 6481  | gtggtcaagt   | cctctgccag   | ggagtggcct | ggcccagcct   | gggcatgttt   | tcatgccagg |
|----|-------|--------------|--------------|------------|--------------|--------------|------------|
|    | 6541  | gtgctagago   | : ctactgccag | attgtctccc | tccaccccca   | atgaaaaaat   | ccttccagaa |
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|    | 6.181 | . rectectect | tccctcttcc   | ttgccccctc | : ttcccctaaa | ccttacagat   | agctcgtgag |
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|    | 6961  | gcagcagctt   | tgatagttct   | gacggagtct | ggcaggtagg   | qccctaaqqq   | caggtaacac |
| 10 | 7021  | tgttaggata   | accagectet   | tgctgcacct | gececaggag   | aagagagaag   | gcccaacctg |
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|    | 7141  | gcagaccaaa   | gggtcctgtg   | gctcagtagg | cacagtagat   | gtcacaggca   | cttaataaaa |
|    | 7201  | gactggtttc   | tgtggagtct   | tgatcttggc | tcagctcaga   | atctccagtg   | attgggctcc |
|    | 7261  | tettggeett   | tgttcccagg   | aacatgttcc | tcaccagctg   | tocagtaact   | ettecette  |
| 15 | 7321  | ctctcctttt   | gtgacaaagc   | tctgacaaag | ctctgtcccc   | ctctcatccc   | tetagaegga |
|    | 7381  | tgttgctccc   | ctagattgcc   | cgtgaggcag | aggctgccat   | Ctaccactto   | caattattta |
|    | 7441  | aggaactccg   | ccgcctggcg   | cccattacca | gcgaccccac   | agaagccacc   | accatagata |
|    | 7501  | ccgtggaggc   | ctccttcaag   | tgctgcagtg | gggccataat   | catcctcacc   | aagtctggca |
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|    | 7681  | cctgccacct   | tgggcctgca   | gggaaggatt | gagcagagcc   | ccttcccaga   | acccasada  |
|    | 7741  | ctctaggtag   | cactcataag   | gaatgtcaga | acatttggat   | Caaaagcaaa   | tttatactaa |
|    | 7801  | agatttatta   | cataacaqtq   | cacaggetga | ctacaaatgg   | ttatttgata   | ttgaaaattt |
|    | 7861  | agtcctctaa   | aattgtaaaa   | gataccactt | ttgcttattc   | cagttactat   | atactettta |
| 25 | 7921  | aaaatttcag   | ttgggaaatg   | aatttattta | aatgctgttt   | actotoctc    | catttggcac |
|    | 7981  | actagtccct   | gctqtttttq   | agccctaaag | acaaattggg   | ttccagctca   | agagaggtta |
|    | 8041  | ctgtgctatc   | ttggctgaca   | ttctgtgggc | ctggcagcca   | gactgaggac   | tatataacct |
|    | 8101  | atgctgggcc   | tccaacttgg   | gatecettee | ttggcccagg   | acattgagtt   | aatgtccttc |
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|    | 8341  | ctcttggctg   | aacagctcca   | acccgtaggg | ttgacctttc   | ttaaaaggtc   | cagttettac |
|    | 8401  | tgtttggcta   | ttttaagctc   | tagtcttctq | gggtttcact   | cagctggtcc   | tagetteage |
|    | 8461  | aattgcttcc   | ctctgaaggc   | cttqcataqa | ggccaagcgt   | gaagtgcagg   | gacttctctg |
| 35 | 8521  | ctgtgatgtg   | gcttaagttt   | ccctgacacc | tgttgagtgt   | cctcataact   | teeettetaa |
|    | 8581  | tgcccctccc   | cageteetga   | gaccagetge | agctacaagt   | gtgcagtgtc   | agtottcaag |
|    | 8641  | aaagtgcctg   | gcagaggggc   | tttagaaggg | tecectigeet  | tccaaaggag   | ctttggcagg |
|    | 8701  | cagacgtgct   | cctgcagcaa   | cactcccatt | tcctgttctt   | acctactasa   | tagcacctag |
|    | 8761  | atttctaagc   | ctcatctaga   | tactcagatt | tgattctggg   | cctttatage   | ccagttgctg |
| 40 | 8821  | ggactgtttc   | aggagctagg   | ggccatgtgg | ggcagggaga   | qqqcacaaaa   | gtagagaagc |
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|    | 9061  | ctgccaacca   | tgggctgtgt   | ggggtaagtg | ggttgaggct   | gatettteta   | aatcaaata  |
| 45 | 9121  | atcctgagcc   | cttgcctgtg   | gaatggggt  | agagggcaat   | ggtaacctag   | ctagcatgct |
|    | 9181  | gtgggggata   | taggatgagg   | qqctqcccqa | ccctcgggag   | gggtcctagg   | gagcagatgt |
|    | 9241  | tgaagaggcc   | agagccctca   | gtgagctgga | tgagggggtg   | agccatttga   | actccctgag |
|    | 9301  | ggtacttcct   | agaacctcat   | gtaatggtct | cttctgtatg   | tececcatee   | catctcagg  |
|    | 9361  | ctqctcacca   | ggtggccaga   | taccqcccac | gtgccccat    | cattactata   | acccggaatc |
| 50 | 9421  | cccagacagc   | tcgtcaggcc   | cacctotacc | gtggcatctt   | ccctatacta   | tacaaggace |
|    | 9481  | caqtccaqqa   | agcctagact   | gaggacgtgg | acctccgggt   | gaactttgcc   | atgaatgttg |
|    | 9541  | gtacgtagct   | ggaggaggg    | ctagagecta | gaggagcttg   | gggatgcttc   | agcattqqcc |
|    | 9601  | accaacctcc   | cttctcttcc   | tccaggcaag | gcccgaggct   | tetteaacaa   | aaaaatata  |
|    | 9661  | gtcattgtgc   | tgaccggatg   | acaccetaac | tccggcttca   | ccaacaccat   | acatattatt |
| 55 | 9721  | cctataccat   | gatggacccc   | agagggggtc | ctccagccc    | tatacceac    | ccttccccc  |
|    |       | -5 554       | J J J        |            |              | - Secretario | coccocca   |

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9781 geccatecat taggecagea aegettgtag aacteaetet gggetgtaae gtggeaetgg
9841 taggttggga caceagggaa gaagateaae gecteaetga aacatggetg tgtttgeage
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9961 ggaagaagga ggaatgetgg aetggaggee ectggageea gatggeaaga gggtgacage
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10 10321 taeetgtatg taataaaeaa eagetgaage aectgttee teetettt
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15 Q01995 - Homo sapiens Transgelin

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SEQ ID NO. 39

25

D84342 Homo sapiens DNA for SM22 alpha, complete cds

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    1501 ccgtgtggta ccttcagccc tggccaagct ttgaggctct gtcactgagc aatggtaact
55 1561 gcacctgggc ageteeteec tgtgccccca gecteageec aacttettac ccgaaageat
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- 28 -

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     1741 tggcggcaaa agcccattga agaagaacca gcccagcctg ccccctatct tgtcctggaa
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    AF026126
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|    | 180     | )1 gtgcaacci   | ta atttttac  | a acceceage  | c cccttttt   | t                            | aggatcctat                   |
|----|---------|----------------|--------------|--------------|--------------|------------------------------|------------------------------|
|    | 186     | 1 tttggtgt     | ct tgatatctg | t tteccacco  | a Ctaagggaa  | a sababasab                  | aggateetat<br>tettaagaga     |
|    | 192     | l aacaaatca    | ac tgtattgtg | c tatogoata  | c tttttt     | g ttttt=-t                   | c certaagaga<br>c aaatttetta |
| •  | 198     | 1 gtattaact    | t acttected  | a attgasats  | a cacttotat  | c trittiggtgo                | aaatttetta<br>atetgeattt     |
| 5  | 204     | 1 agtgtatta    | a aatgcagca  | t ttaggatta  | a cagilgiai  | a tactacctaa                 | atctgcattt<br>g caggagggac   |
|    | 210     | 1 taaatcago    | it ttettaatt | g agttttgt   | a gatogath   | a cgggagttag<br>a ctgaccgatg | g caggaggac                  |
|    | 216     | 1 cacgettee    | a tteetttt   | g taatooooa  | a gottotgatt | a ctgaccgatc                 | atcgtgggtt tttttaa           |
|    | 222     | 1_ctgtaaaga    | a aaaaatatt  | g ataasyyya  | g gggrgrgrg  | g ctttaatcta                 | : ttttttttaa                 |
|    | 228     | 1 acacqattt    | c ttttactga  | g aaagaggg   | a caayatgtc  | g ctttaatcta<br>g ggaaagttgg | gtattagaaa                   |
| 10 | 234     | 1 gcactttgg    | a atatagggt  | t tattaacc   | a ggatttgga  | g ggaaagttgg<br>a gattettgte | i gaggggagaa                 |
|    | 240     | 1 atgatagto    | c taatttaa   | aasataata    | a taganaga   | a garrettgte<br>a agcaaacttt | aggctgtttg                   |
|    | 246     | 1 acagaacca    | a ctcgaattg  | t atatacett  | g ryggaaggga | a agcaaacttt<br>g gaagatgtta | taaaaattaa                   |
|    | 252     | 1 aacttaaaa    | c ctttaacati | ttgatttta    | a tttgayaaa  | gaagatgtta<br>totgttottt     | gatatttgga                   |
|    | 258     | 1 accaaaatq    | a ttaattotai | aacttcctc    | t ttagasaa   | ctttctgtta                   | ggacagaggc                   |
| 15 | 264     | 1 ttcaaatcq    | c aaagcagcto | actttatag    | t taggiggage | tgaagtgtaa                   | gccctgataa                   |
|    | 270     | 1 gtttttaac    | c ctaacagtgt | . caaaaacta: | a aactacatt  | ttgattggtaa<br>ttgattggtt    | atgaattaaa                   |
|    | 276     | 1 ttgttaatt    | c cctacccati | : caaactcct  | a adctagaatt | totgattggtt<br>totgaagcag    | gctgtaccgg                   |
|    | 282     | 1 gegggaaga    | a tootaaatet | : tttaaattt  | - attactatat | tataaaggtt                   | cgacggcaca                   |
|    | 288     | 1 taatatota    | g aggetatata | ttaatteatt   | accordigiat  | ccccaggaaa                   | tcagtagtca                   |
| 20 | 294     | l tagtacata    | c agtaggttte | tacctooget   | geecarigat   | tataggcatc                   | ttctagacca                   |
|    | 300     | 1 tttgggcaa    | a attgatgcc  | ttacatoot:   | tttaatatetat | ggtaatgcatc                  | atgtgtaatc                   |
|    | 306:    | l tttggcaat    | t taaggtaaag | : aattagtaac | . cruggietgt | ggtaatgcat<br>tatcgagcaa     | gtagttgcag                   |
|    | 312     | l taccqtaat    | c ttcacattto | atttattta    | gatattita    | tattgagcaa<br>tatttttgtt     | gaaaaaatat                   |
|    | 3183    | Lttaatggc      | t aaatatgaag | actecttest   | agargaaaaa   | gtgtttaaaa                   | ggaatttaag                   |
| 25 | 3242    | l gttatactq    | a aatattetoo | agatgtctga   | acaaaacacc   | taagcagcac                   | tgtcatgcat                   |
|    | 3301    | ggaaaaatq      | ttqtctttta   | cctagcatat   | ttotaaata    | acctttaata                   | tgtgtattat                   |
|    | 3361    | gtatatata      | atatatatat   | ototatatat   | atatacca:    | aaaaggtiggg                  | aaatgtgtgt                   |
|    | 3421    | tttccactac     | agctettace   | agattttta    | ttttgagtet   | gatttggctg                   | ctaatgtggc                   |
|    | 3481    | aacaqttqqt     | tgacatgtat   | tcacaattgg   | atracttete   | tttggaagct                   | gaatattaat                   |
| 30 | 3541    | gtattqttct     | ttttatccat   | catttecat    | cccctaaata   | tcagtctttc                   | ggtaggttga                   |
|    | 3601    | attatattt      | aattttcagg   | ggtttataca   | ccaccadacg   | agagtagaag                   | tgcttttagg                   |
|    | 3661    | . tgcaggcagt   | taacttatat   | Ctttacaage   | tacattctat   | tttaagagcc                   | gccactaact                   |
|    | 3721    | aacatttaaa     | gatttgctta   | tcactgtatt   | ctcatccac    | gaaatcagtc                   | tatttagggt                   |
|    | 3781    | ttggagaaaa     | agcagatogo   | aaacaggcaa   | CCCCCCCCC    | aaaaaagagg                   | cagctttacc                   |
| 35 | 3841    | actggggtca     | cagtttcgat   | gaatgttatt   | ccctatattt   | ggtgagtggt                   | aaaaaaaag                    |
|    | 3901    | agctcaattt     | cactgctage   | taatagtggc   | aaattaagat   | taaactataa                   | gggcactagc                   |
|    | 3961    | attactccat     | tatgtatttt   | gagteteato   | taattottto   | cagtgatttg                   | actatttgac                   |
|    | 4021    | aaacttaaat     | ttgaaggtca   | gtgttttgac   | tettegaagt   | aattacactt                   | aaatgaccat                   |
|    | 4081    | ctaaaacgat     | gtaatattac   | aactttttc    | aataatctca   | ggaaaaatgg                   | gacctgctac                   |
| 40 | 4141    | atattcatag     | ttaataaaca   | ttctagatag   | taaccaacta   | tcatttactg                   | agaaatgttt                   |
|    | 4201    | tttacccagg     | tttattttat   | ttttgagacg   | gagtttaggt   | tttgttgccc                   | aaaataaaat                   |
|    | 4261    | gcagtggtgt     | gatettgget   | Cadcacaacc   | tccacctccc   | aggttcaagc                   | aggctggagt                   |
|    | 4321    | cctcagcctc     | caaagtagtt   | gggattacag   | gcatattcca   | ccatgcctgg                   | aatteteetg                   |
|    | 420T    | attitagta      | qaqacaqqqt   | ttetteatet   | taatcaaact   | ant at areas                 | <b></b>                      |
| 45 | 4441    | aggtgatccg     | cetaceteaa   | cctccccaag   | tactataata   | acaggcgtga                   | tecegacete                   |
|    | 4501    | ccggcctagc     | caggttgatt   | ttaaaattac   | acttagaaat   | aatgttctca                   | gccactgcgc                   |
|    | 4561    | ctctaatatt     | tgacttttct   | taactttcca   | attatocaco   | cctatcctgt                   | tttttaaggg                   |
|    | 4621    | aaggctttct     | ttttgaatga   | aaaactttca   | gacttttt     | tetetettt                    | ccagacgtt                    |
|    | 4681    | tggtgtctgc     | actccccacc   | gtatctgtcc   | cttcctcttt   | ctcccatttt                   |                              |
| 50 | 4,47    | acaayyycaa     | caqttttata   | gtctcaatat   | taaaaataaa   | actoottant .                 |                              |
|    | 4801    | tccaaattqa     | atttattaaa   | cacagttoto   | tatacattta   | cttctgcaaa                   | agatagagta                   |
|    | 1001    | aagigallac     | agtttcatcc   | taaaatactt   | taaaaatcac   | ttaatttaa .                  |                              |
|    | 4 J Z I |                | qcatqtaaqa   | atqqacaqct.  | atttttagge   | 200021                       |                              |
|    | 4981    | agctactcaq     | gaggetgagg   | caggagaatt   | getteaacca   | aggcatgcac d<br>gggaggtgga d | rgttatccc                    |
| 55 | 5041    | agcctagatc     | atgccattgc   | actocagoog   | adacascsas   | gggaggtgga g<br>gtgagactct g | gergeagtg                    |
|    |         | - <del>-</del> | 5 5 -        |              | Jagogucuya   | gryayactet g                 | jiitaaaaag                   |

|     | 5101 | aaaaaaataa | gtatttgtaa | atotatatat | atatatatat | 202020202  | 2020202121 |
|-----|------|------------|------------|------------|------------|------------|------------|
|     |      | atatataaaa |            |            |            |            |            |
|     |      | ctaagtgccc |            |            |            |            |            |
|     |      |            |            |            |            |            |            |
| 5   | 5201 | tagagtttgg | ggctgggtat | ggtactteg  | cergraatee | cagcagtttg | ggaggetgga |
| ,   | 2347 | gcgggcggat | cacttgagge | caggagerca | agaccagcci | ggccaacgag | gggaaacece |
|     | 5401 | gtctctacta | aaaatgcaaa | aatcaagtca | aacaraaraa | tgcagcctgt | aatccctccc |
|     | 2401 | acggaggctg | aggaacgaga | accaetttga | acctgggagg | cagaggttgc | agtgagctga |
|     |      | gattgtgcca |            |            |            |            |            |
| 10  |      | ccagaaacag |            |            |            |            |            |
| 10  |      | attggtccag |            |            |            |            |            |
|     |      | tttttaaag  |            |            |            |            |            |
|     |      | aagccagaat |            |            |            |            |            |
|     |      | taggtgcttg |            |            |            |            |            |
| ٠ . |      | cttactctgc |            |            |            |            |            |
| 15  |      | gaaaagtaga |            |            |            |            |            |
|     |      | gaccctgtgg |            |            |            |            |            |
|     |      | gattactgta |            |            |            |            |            |
|     |      | atttcaaatg |            |            |            |            |            |
|     |      | ttaagggagg |            |            |            |            |            |
| 20  |      | ttttaatatt |            |            |            | _          | _          |
|     |      | gaacccttgt |            |            |            |            |            |
|     |      | cgtttggaga |            |            |            |            |            |
|     |      | ctgcttcttg |            |            |            |            |            |
|     |      | tgttttaatt |            |            |            |            |            |
| 25  |      | ttttcccaat |            |            |            |            |            |
|     |      | atctgaatag |            |            |            |            |            |
|     |      | tagaactgtt |            |            |            |            |            |
|     |      | tctgtaataa |            |            |            |            |            |
|     |      | tctgttgtgg |            |            |            |            |            |
| 30  |      | tctcattaaa |            |            |            |            |            |
|     |      | ctgtgaagga |            |            |            |            |            |
|     |      | aaataaagat |            |            |            |            |            |
|     |      | gaaaataact |            |            |            |            |            |
|     |      | cattatgggt |            |            |            |            |            |
| 35  |      | ttcaagcctg |            |            |            |            |            |
|     |      | gaatacatgt |            |            |            |            |            |
|     |      | actctgcact |            |            |            |            |            |
|     |      | agatcagtaa |            |            |            |            |            |
|     |      | aagggacagt | _          |            |            |            |            |
| 40  |      | cccacaagat |            |            |            |            |            |
|     |      | gtgtcacatc |            |            |            |            |            |
|     |      |            |            |            |            |            | aattctgaca |
|     |      | gtttaccctt |            |            |            |            |            |
|     |      | ggtataggat | -          |            |            |            | _          |
| 45  |      | aagctgccag |            |            |            |            |            |
|     |      | aatatttat  |            |            |            |            |            |
|     |      | cacccatcac |            |            |            |            |            |
|     |      | tactgtaaac |            |            |            |            |            |
| 50  |      | aaattgttta | _          | _          |            |            | _          |
| 50  |      | gctcacaact |            |            |            |            |            |
|     |      | tgagagaact |            |            |            |            |            |
|     |      | atcagtgggg |            |            |            |            |            |
|     |      | aagctaagat |            |            |            |            |            |
|     |      | ttatgtacag |            |            |            |            |            |
| 55  | 8341 | tttgctgctt | gctcactatt | ttgtaattat | ttgggagcag | cagtaataag | ccagctttt  |

|     | 840          | l ggaataggat | t gttcctgate | g tgtggttat  | g taggaagaat | gatgttttaa   | tatactgccc   |
|-----|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
|     | 040.         | ı ağıaaacıg  | , rgcagtttgg | J aaaaggtqt  | g ttattgatgt | : ggataatatt | taagggaatt   |
|     | 032.         | ı illiciaayı | : allitaatao | getttttq     | t ctttacacca | a aaatgittat | aggagggett   |
| _   | 058.         | ı agctgggaca | a ctacaaagaa | agateetaad   | g gaaaactttt | : atgtacagta | tttttac++    |
| 5   | 004.         | ı gggtatatgı | ttatettta    | i qcaaqttgaa | a agacttaatt | tactacttac   | + da atatt   |
| -   | 0 / 0 .      | i glaattallt | gggaqcaqca   | l qtaataagc  | c agotttttoo | , aataggatgt | taataatata   |
|     | 0,0.         | Luggicalge   | i yyaayaatga | tgttttaata   | a tactocccac | r taaactooto | Cactttcca    |
|     | -0-0-2-      | . aaygigigi  | allyatgtqq   | i ataatatta  | aggcaattti   | ttttaagget   | ++++         |
| 10  | 000          | Locuttegeet  | . ccacaggaaa | atotttatad   | a agacettae  | r ctadaacact | 2022200      |
| 10  | 0243         | . accegaayga | CLACLLLEC    | aaatttqqtd   | i aaqttqtaga | ctgcactctg   | aagttagatg   |
|     | 2001         | ccaccacage   | , ycyatcaagg | ggttttqqct   | : ttqtqctatt | . taaagaatcg | gagagtgtag   |
|     | 2001         | . acaaggtagt | grgrracgrg   | 'ttctgatcac  | ı ttaataatat | aaaatattaa   | catatogata   |
|     | 3171         | . gtttgataca | . atgagtttgc | ctatttqtqc   | , ttccccattt | tgatagtata   | 0022002202   |
|     | 3181         | atagttettg   | r ccccaatacg | ttttatgaac   | i atagaggtag | gttcaggaat   | tatttcctca   |
| 15  | 2241         | . ataatttgtg | ttccaggctc   | tgctaaattt   | : tgaaattaac | tttaaagata   | ctatagactt   |
|     | 2301         | . aaagatgcct | agttaaaagg   | atgtgtttta   | ı qcaattcaca | gaagtecata   | ttttgaaatt   |
|     | 2201         | . ccgctaggca | agcaactttt   | aactgaatca   | : ttattttgat | cctgggctaa   | adddaadtad   |
|     | 2421         | . cagttatgtt | tgtatatagt   | gctaaaqqqa   | agtagcagtc   | atgittgtat   | atattgaagg   |
| 20  | 2497         | Laacggttat   | ctagtaattg   | gttaaatttq   | r tatatatect | accattctta   | cctttagatt   |
| 20  | 2341         | taaacagtat   | atgttagttg   | atgttacatc   | : accaccatga | cttgacagtt   | taatcttcac   |
|     | APOT         | caagtcaaca   | tatgcttggc   | attatctgta   | tttatagtta   | tttttaagta   | agttaatagt   |
|     | 3001         | ctctgaactt   | cagttaagat   | atatatttt    | taaatqaaaa   | cttcaatttc   | cttaggtcat   |
|     | 9/21         | ggatcaaaaa   | gaacataaat   | tgaatgggaa   | ggtgattgat   | cctaaaaggg   | ccaaagccat   |
| 0.5 | 9/81         | gaaaacaaaa   | gagccggtta   | aaaaaatttt   | tgttggtggc   | ctttctccag   | atacacctga   |
| 25  | 9841         | agagaaaata   | agggagtact   | ttggtggttt   | tggtgaggta   | tottataaat   | gttttgaccc   |
|     | AAOT         | agtttatgtc   | aaaattagtg   | tgaatgtgat   | tgtcccatta   | tggactcaga   | gtcacttggc   |
|     | 3361         | ttttcaaagc   | tgttagggta   | gattatgtga   | tctgttttgg   | aataaggata   | ttgtaaatac   |
|     | T0071        | ttcattagca   | ggtctttgaa   | ggttggataa   | tgtqtttttc   | tcattgagca   | cctactctat   |
| 20  | 10081        | gcagagtatt   | gctggggtag   | agtataccaa   | agatgaaata   | gacaaacatt   | cttaaataca   |
| 30  | 10141        | gacaattaag   | aggaagaaat   | ctagattaga   | aggagacttt   | tottoaaaat   | aggaaaggaa   |
|     | 10201        | ttaagaatag   | ggtgtagtgc   | cttatcagtt   | gaaatgcatq   | tgtaagtgca   | aatttaatga   |
|     | 10791        | gactaatcat   | tatagactca   | ttagtgaggc   | tggacgcgat   | ggctcatgct   | gtagtaatcc   |
|     | 10321        | cagcacttgg   | gaggccgaag   | tgggtggatt   | actggagacc   | aggagatgaa   | gaccatcctg   |
| 25  | T038T        | gacaacatag   | tggacccgtc   | tcaattaaaa   | gtaaaacaaa   | cttagaetca   | ttagtgaaat   |
| 35  | 10441        | aggtagataa   | tagaggtttc   | ttttatgaat   | taatgaatta   | atgaaagttg   | agaaatttgt   |
|     | 10201        | ggccttgggc   | tccagatacg   | tcccacagac   | atttattqct   | tgattgaaac   | aataaqtqct   |
|     | 10201        | tttttagtgt   | tgaggatttg   | agatattgcc   | cacaaaactc   | agtatctage   | tttttaaaaa   |
|     | 10671        | atatttgcaa   | gagcacgcaa   | catgggaact   | gacgetgeee   | tcctgtacgg   | cagcatictict |
| 40  | T098T        | caaactgagt   | agtagcttcc   | atcttggttt   | gggcatatgc   | tetecagete   | ttagtagtcc   |
| 40  | 10741        | tcaccaccct   | acttcctgtt   | ttctctcaaa   | tacattttt    | ttctgttttt   | cttagatttg   |
|     | 10801        | actgttttct   | tcttgttctt   | tgtgggcatt   | tgaatttgtg   | acccttgagt   | taggtagtaa   |
|     | T086T        | atgtcagtgc   | gtggtaaagc   | ttatttttgt   | aaatagttgt   | gaagacctta   | gatggaatgg   |
|     | 10921        | gtgttctaat   | ttgaagaatt   | ccttaaaagg   | attagaataa   | atagggagaa   | acaggagact   |
| 45  | 10981        | agaacttcag   | tgccaaatac   | atgttttctt   | tgtgtgtttt   | ccccctcta    | aacttgtgtt   |
| 43  | 11041        | tcttttaagg   | tcaataaaat   | gcatgttagc   | atattaaaat   | ttgtttttta   | ataccaggtg   |
|     | 11101        | gaatccatag   | agctccccat   | ggacaacaag   | accaataaga   | ggcgtgggtt   | ctgctttatt   |
|     | <b>TTTPT</b> | acctttaagg   | aagaagaacc   | agtgaagaag   | ataatggaaa   | agaaatacca   | caatgttggt   |
|     | 11771        | cttagtaaag   | taagttaagc   | atccatttac   | ttgtagagaa   | aactagctgt   | tgtaaagagc   |
| 50  | 11781        | ttaaccattt   | atctttctct   | gtaaaggctt   | aagttctttg   | catgctttaa : | aaacttctca   |
| 30  | 11341        | ttggttactt   | accattgacc   | aactttttgt   | ggggagcagg   | atggacacat : | ttgttagtgt   |
|     | 11401        | ttttgtctag   | gctttcacaa   | aaataqtttt   | tagaacttga   | caaqtaaaat / | raactaacat   |
|     | TT40T        | cactagcaag   | tactcataag   | tgattactct   | taaqtactaa   | atattggttt : | aattaataaa   |
|     | 11251        | ctgactgagg   | aaagtttcaa   | attagectae   | tctatttaaa   | catottoort : | atteteetta   |
| 55  | 11281        | ttagaaactt   | atttagcaac   | ttttatttc    | ttgagtcagt   | ttaataatot a | atttttctc    |
| رر  | 11041        | ttttagtgtg   | aaataaaagt   | agccatgtcg   | aaggaacaat   | atcagcaaca g | gcaacagtgg   |
|     |              |              |              |              |              |              |              |

|    | 11701             | ggatctagag  | gaggatttgc | aggaagagct | cgtggaagag | gtggtggtaa | gctagagcct  |
|----|-------------------|-------------|------------|------------|------------|------------|-------------|
|    | 11761             | aagtttactc  | tatcttaagc | ttttctgctt | tttaattatc | ctgaagtaaa | gatctttgct  |
|    | 11821             | gatcttctga  | ctttagtgaa | cctattaatg | tgctqcaqgc | cccagtcaaa | actggaacca  |
|    | 11881             | gggatatagt  | aactattgga | atcaaggcta | tggcaactat | ggatataaca | gccaaggtta  |
| 5  | 11941             | cggtggttat  | ggaggatatg | actacactgg | ttacaacaac | tactatggat | atggtgatta  |
|    | 12001             | tagcagtaag  | tactatactt | tttatattaa | ctgctatttg | acatttattt | tgtacaaatt  |
|    | 12061             | tggataggca  | gaaaggttag | tgtagccttg | ccaaqtqcaa | atgtcttcag | gtttcaaatt  |
|    | 12121             | cctggaaact  | tgaaactgca | gccattttat | tacttaattc | ctcccacct  | atatcacaca  |
|    | 121 <del>81</del> | -cacattataa | gggtagggtg | tatgtgtggt | tctatatatq | tttactagac | atttgtttta  |
| 10 | 12241             | cttggattta  | aaaattttaa | gctcagttca | gatcttttaa | gctcaaggta | ttctaaatgt  |
|    | 12301             | cacttcttgg  | accaáccaat | aatcttqqca | tgatgtgtct | taatcctata | aaactgaata  |
|    | 12361             | ataccacatg  | ttgccagtta | aaactaataq | tatecteget | ttaggattat | taatgtagaa  |
|    | 12421             | actcttaaaa  | cagatgttga | gcttgataga | accaaaaaac | ttgactttta | gacatggaaa  |
|    | 12481             | gccctgactt  | cattetecaa | ctaaggtagt | toctctccac | ctgatttgta | gcaactgttg  |
| 15 | 12541             | agtcgtcagg  | taaagggttc | tactagaage | aatcttacat | ttttttagag | gagagtggtt  |
|    | 12601             | gcattggttg  | cattettta  | agtggttttt | cttttccttc | Cttggtraga | ccagttcttg  |
|    | 12661             | gagttatatc  | ctttcttagg | tgactaggcc | tgctgcacaa | taataggtta | attaaagtca  |
|    | 12721             | gaagaaggtc  | agcaaagatg | gattgggtga | gattggggcc | cttttcttag | aagggcagag  |
|    | 12781             | atactaagca  | ctgattgtgg | ttgacaattt | gttctaaatt | ttaagatatt | ttttactaat  |
| 20 | 12841             | ggttgtgaaa  | gggtcagctg | tccatccttt | gaaacttaaa | acttttaaac | tataagggta  |
|    | 12901             | aggggattgt  | ctcccatttt | atacaataag | tcaagtaatc | agctcattct | gaatgectge  |
|    | 12961             | cattgtatgc  | attcactaca | tatttggtaa | attatttgat | aaatgattgc | t.cagggtgaa |
|    | 13021             | tttttcacac  | ttgggaatta | agctaccctt | aatttttga  | gattgtttaa | aattaggtac  |
|    | 13081             | tgttctgatt  | attagtatgt | aaccactacc | gttctggttc | taacacttot | tttattttag  |
| 25 | 13141             | accagcagag  | tggttatggg | aaggtatcca | ggcgaggtgg | tcatcaaaat | agctacaaac  |
|    | 13201             | catactaaat  | tattccattt | gcaacttatc | cccaacaggt | atottctaaa | aatagtttt   |
|    | 13261             | ttttgtcatt  | tacaataqta | gtttttataa | tctatattgt | tcataaaaca | atgcttaatt  |
|    | 13321             | taagagtttc  | acagcaccca | qaaqtqctta | ccatattata | acatagtgac | tttcaaaaga  |
|    | 13381             | tatgtaacac  | aggtgctctt | aagcttttgc | ctttttgtcc | tattattaac | aagtcagtaa  |
| 30 | 13441             | agttaacagg  | taaaqtactq | ctaatqqqta | caaattaagg | aattgcagca | aaaaaqtatt  |
|    | 13501             | gcctactaac  | tctgacatta | taccttgttt | gtaccgccag | cgggaacttc | attgcaggcc  |
|    | 13561             | ctgtgtcgcg  | ctgacttcag | attctcacaq | gcccgctcaa | tgcggacagg | gtaacgagat  |
|    | 13621             | gctccacgct  | ctcqaatqct | accatttaat | atggtctctt | ccaacatcct | gtatcagcat  |
|    | 13681             | tataaaataa  | aatggatact | tcaaqctttq | ccttcactta | tttctttact | ttttaaaaac  |
| 35 | 13741             | tatttgtaat  | gtaattttaa | tqcatttttt | acaggcccag | taatggttaa | atacqtcaqc  |
|    | 13801             | ttactqaata  | attttaacta | tttattcttc | taaggataca | acttatetet | ggattttcca  |
|    | 13861             | gtcttaattt  | tatattttat | taatctattt | taatgcttgc | ttttcccatt | tatagacgtt  |
| •  | 13921             | gtagcagtaa  | ttqcaaqaaq | ttcttgagct | gaattcctgt | tgtgacaact | tcctataatt  |
|    | 13981             | acagtagata  | actttttctt | ttaqtcqtat | ataactttc  | tataacttgt | gatggacaag  |
| 40 | 14041             | agatatgett  | atccaataaa | ataaqcttaa | atattagatg | ctcttgggtc | aaaatgtcct  |
|    | 14101             | tttaccaaat  | tgaccttttt | atgagttett | tgggtaaata | ctttaaagct | ttttatattt  |
|    |                   |             |            |            | ttaaaccagt |            |             |
|    | 14221             | gctcatggac  | tctactqttc | agctttaatt | tataaaacat | atcacacatt | taatottata  |
|    | 14281             | cagtatttac  | atatagtgga | acatagggat | aactcagttt | tatgtaaatt | tttattaaat  |
| 45 | 14341             | gttgtagcct  | gcccagagtg | acttctattt | tttcttcttt | atctccaggt | aataaaacaa  |
|    | 14401             | tattttccaa  | tttgaagatt | catttgaagg | tggctcctgc | cacctoctaa | tagcagttca  |
|    | 14461             | aactaaattt  | tttqtatcaa | gtccctgaat | ggaagtatga | cattagatca | ctctgaagtt  |
|    | 14521             | taattctgag  | ttctcattaa | aagaaatttg | ctttcattgt | ttratttett | aattoctato  |
|    | 14581             | cttcagaatc  | aatttgtgtt | ttatgccctt | tccccagta  | ttatagagga | agtettatat  |
| 50 | 14641             | taaaagccca  | gtgtgacagt | gtcatgatgt | agtagtgtct | tactoottt  | ttaataaatc  |
|    | 14701             | cttttgtata  | aaaatgtatt | ggctctttta | tcatcagaat | aggaaaaaa  | tatcatagat  |
|    | 14761             | tcaagttatt  | aaaaqcataa | gtttggaaga | caggettgee | gaaattgagg | acatoattaa  |
|    | 14821             | aattqcaqtq  | aaqtttqaaa | totttttage | aaaatctaat | ttttaccata | atototocto  |
|    | 14881             | cctqtccaaa  | ttgggaatga | cttaatotca | atttgtttgt | taattattt  | aataatactt  |
| 55 | 14941             | ccttatqtaq  | ccattaaqat | ttatatgaat | attttcccca | ato        |             |
|    |                   |             | _          |            |            |            |             |

```
SEQ ID NO. 42
```

5 NP\_852000 GSK-3 Binding Protein - FRAT1

mpcrreeeee ageeaegeee eedsflllqq svalgssgev drlvaqiget lqldaaqhsp aspcgppgap lrapgplaaa vpadkarspa vplllppala etvgpappgv lrcalgdrgr vrgraapycv aelatgpsal splppqadld gppgagkqgi pqplsgpcrr gwlrgaaasr rlqqrrgsqp etrtgdddph rllqqlvlsg nlikeavrrl hsrrlqlrak lpqrpllgpl sapvheppsp rspraacsdp gasgraqlrt gdgvlvpgs

15 SEQ ID NO. 43

20

NM\_005479 Homo sapiens frequently rearranged in advanced T-cell lymphomas FRAT1), transcript variant 1, mRNA

I ggatteegge teeegegget geaggegege ggetagagtg cetggeggge teeggettee 61 gcgtccgccc cggccccggt ccagacttag tcttcagctc cgcgcccgct ccgccgcggc 121 ccacegegee egeeggeage egageeecea gegaegeeeg cacageteeg ggtgeeeaga 181 cagggggcca tgccgtgccg gagggaggag gaagaggaag ccggcgagga ggcggaggg 25 241 gaggaagagg aggaggacag etteeteeta etgeageagt eagtggeget gggeageteg 301 ggcgaggtgg accggctggt ggcccagatc ggcgagacgc tgcagctgga cgcggcgcag 361 cacagecegg ectegeegtg egggeeeeeg ggggegeege tgegggeeee ggggeeeetg 421 gctgcggcgg tgccgcgga caaggccagg tccccggcgg tgccgctgct gctgccgccc 481 gcgttggcgg agactgtggg cccggcgccc cctggggtcc tgcgctgcgc cctgggggac 30 541 egeggeegeg tgeggggeeg egetgegeee tactgegtgg eegagetege caeaggeeee 601 agegegetgt ecceaetgee eccteaggee gaeettgatg ggeeteeggg agetggeaag 661 cagggcatcc cgcagccgct gtcgggtccg tgccggcgag gatggctccg gggcgccgcc 721 gcctcccgcc gcctgcagca gcgacgcggg tcccaaccag aaacccgcac aggcgacgac 781 gacccgcacc ggcttctgca gcagctagtg ctctctggaa acctcatcaa ggaggccgtg 35 841 cgaaggette attegegaeg getgeagtta egtgeaaage tteeceaaeg eeegeteetg 901 ggacctetgt eggeceeggt geatgaacce eettegeete geageceteg egeggeetge 961 agtgaccctg gcgcctccgg gagggcgcag ctcagaactg gcgacggcgt tcttgtgcct 1021 ggcagctaac acgcccgggg tggccacagc gccagcctca gactggaggg caaggggttc 1081 ccttgagggc tgcagttcta ctcaggctgg tggagaactc tggcttttgg aagcgagagt 1141 aaaaagctaa tgacgaggaa ccgaaaaatc gcgagtgttt cgcgggtaac tggggttgag 1201 ggccaaaata tttggaatga aggacttggc cctatttaag gcagatttta cagagcgcac 1261 etcaaacgta caagtcagta ggactcetta tttggegtga eeegaeetgg eegeggagee 1321 tgcatttcct cgcagcctct cagtgccctc cagccccgcg accatgtggc cacaatccac 1381 gcttctccgg atcgcggtgc gccggaacca cggaggatga tgccagttac ttgctttacc 1441 ttttcagggc tggctcctga tccactttgg gggaggagaa catgagtaga taatttcagg 1501 gtgcagccca atctgccaga cttaaaaaaa ccatcttgtg tctttggagg tgctgcttaa 1561 taccaaacat geggtgecat gaagggacce tttgggggtt gaataggagt taacceetge 1621 getetettig caactgiete tetteteaga giggiggigg aaggetgiac gacacgggig 1681 gggaaaggag gtggggggg ggagtattga atggtggtgg aagggtagag aggcgcggag 1741 tgaaccccac gccctgtcta aagtgtattt tcagagccgg cccgcctctc ctcggttcaa 50 1801 ggtcactgtt teetgggeae geaetgggtt gegggaeaga gtageeaggt tetgeeggtg 1861 ctcggagaag agcgcagtgt tttgcaagtg ctggagtctc ctgaggacac gcgcgtcgcc 1921 gccaccgcgg gtgtgggaaa gcgcggacgt gctgggcggc tgtgcttcgg taggcgacca 1981 ccgcccetgg ccgcgctccg ggctttcacg gaaactcccg agaccgggcc ctgggttcct 2041 cetetectae teggetetge agtectaete aagegggtgg etetgggate etgggggeet

```
2101 gggttgggg ctagggagac gccatgtgat ggacactcca gggacacaca gcctagcaca
2161 gcagcttata atgggctete eggggecatt tgcaataaca gctgcaatte ectggataga
2221 egagttgatt teeteetet geceeteeee eagecatgee agetggeett tgtaagtgea
2281 ggaaacegag tagaaaatgt gaceeteeaa atggagaage tgeaggettt gecattgtga
2341 accatggtga agtgettgga acatactgtt eacteactet aaaggegetg agaetgtget
2401 gttgtteteg tttttatagt eaatggettg tteateatee agatgtgget actgacatat
2461 etacactteg eaceggagtg tetggaattg tggetateet gattatagga ttttaactta
2521 actgaaatge etgetttgaa taaatgtgtt gggttttttg ttttgtttta ttttataett
2581 gecateagtg aaaaagatgt acagaacaca ttteetegat etecataaca atgaaaacac
10 2641 ttgaaatete aaa
```

15 NM 181355

Homo sapiens frequently rearranged in advanced T-cell lymphomas FRAT1), transcript variant 2, mRNA

```
1 ggattccggc tcccgcgct gcaggcgcgc ggctagagtg cctggcgggc tccggcttcc
20
      61 gegteegeee eggeeeeggt eeagaettag tetteagete egegeeeget eegeegegge
     121 ccaccgcgcc cgccggcagc cgagccccca gcgacgcccg cacagctccg ggtgcccaga
     181 cagggggcca tgccgtgccg gagggaggag gaagaggaag ccggcgagga ggcggaggg
     241 gaggaagagg aggaggacag cttcctccta ctgcagcagt cagtggcgct gggcagctcg
     301 ggcgaggtgg accggctggt ggcccagatc ggcgagacgc tgcagctgga cgcggcgcag
     361 cacagecegg cetegeegtg egggeeeeeg ggggegeege tgegggeeee ggggeeeetg
     421 gctgcggcgg tgccggcgga caaggccagg tccccggcgg tgccgctgct gctgccgccc
     541 egeggeegeg tgegggeeg egetgegeee taetgegtgg eegagetege cacaggeeee
     601 agegegetgt ecceaetgee eccteaggee gaeettgatg ggeeteeggg agetggeaag
30
     661 cagggcatcc cgcagccgct gtcgggtccg tgccggcgag gatggctccg gggcgccgcc
     721 gcetcccgcc gcctgcagca gcgacgcggg tcccaaccag aaacccgcac aggcgacgac
     781 gaccegcace ggettetgea geagetagtg etetetggaa aceteateaa ggaggeegtg
     841 cgaaggette attegegaeg getgeagtta egtgeaaage tteeceaaeg eeegeteetg
     901 ggacetetgt eggeceggt geatgaacce cettegeete geageceteg egeggeetge
35
     961 agtgaccctg gcgcctccgg gagggcgcag ctcagaactg gcgacggcgt tcttgtgcct
    1021 ggcagetaac acgcccgggg tggccacagc gccagectca gactggaggg caaggggtte
    1081 ccttgagggc tgcagttcta ctcaggctgg tggagaactc tggcttttgg aagegagagt
    1141 aaaaagctaa tgacgaggaa ccgaaaaatc gcgagtgttt cgcgggtaac tggggttgag
    1201 ggccaaaata tttggaatga aggacttggc cctatttaag gcagatttta cagagcgcac
    1261 ctcaaacgta caagtcagta ggactcctta tttggcgtga cccgacctgg ccgcggagcc
    1321 tgcatttect egeageetet cagtgeeete cageceegeg accatgtgge cacaateeae
    1381 getteteegg ategeggtge geeggaacea eggaggatga tgeeagttae ttgetttace
    1441 ttttcagggc tggctcctga tccactttgg gggaggagaa catgagtaga taatttcagg
    1501 gtgcagccca atctgccaga cttaaaaaaa ccatcttgtg tctttggagg tgctgcttaa
45
    1561 taccaaacat gcggtgccat gaagggaccc tttgggggtt gaataggagt taacccctgc
    1621 gctctctttg caactgtctc tcttctcaga gtggtggggg aaggctgtac gacacgggtg
    1681 gggaaaggag gtggggggg ggagtattga atggtggtgg aagggtagag aggcgcggag
    1741 tgaaccccac gccctgtcta aagtgtattt tcagagccgg cccgcctctc ctcggttcaa
    1801 ggtcactgtt tcctgggcac gcactgggtt gcgggacaga gtagccaggt tctgccggtg
    1861 ctcggagaag agcgcagtgt tttgcaagtg ctggagtctc ctgaggacac qcqcqtcgcc
    1921 gccaccgcgg gtgtgggaaa gcgcggacgt gctgggcggc tgtgcttcgt caatggettg
    1981 theateater agatgtgget actgacatat ctacaetteg caceggagtg tetggaattg
    2041 tggctatcct gattatagga ttttaactta actgaaatgc ctgctttgaa taaatgtgtt
    2101 gggttttttg tttggtttta ttttatactt gccatcagtg aaaaaqatgt acagaacaca
    2161 tttctctgat ctccataaac atgaaaacac ttgaaatctc aaa
```

```
SEQ ID NO. 45
```

NP 444254

myosin light chain isform kinase 2

```
mgdvklvass hisktslsvd psrvdsmplt eapafilppr nlcikegata kfegrvrgyp
     epqvtwhrng qpitsggrfl ldcgirgtfs lvihavheed rgkytceatn gsgarqvtve
     ltvegsfakq lgqpvvsktl gdrfsasave trpsiwgecp pkfatklgrv vvkegqmgrf
     sckitgrpqp qvtwlkgnvp lqpsarvsvs ekngmqvlei hgvnqddvgv ytclvvngsg
10
     kasmsaelsi qgldsanrsf vretkatnsd vrkevtnvis keskldslea aakskncssp
     qrggsppwaa nsqpqppres klesckdspr tapqtpvlqk tsssitlqaa rvqpeprapg
     lgvlspsgee rkrpapprpa tfptrqpglg sqdvvskaan rripmegqrd safpkfeskp
     qsqevkenqt vkfrceglav mevapsfssv lkdcaviegq dfvlqcsvrg tpvpritwll
15
     ngqpiqyars tceagvaelh iqdalpedhg tytclaenal gqvscsawvt vhekkssrks
     eyllpvapsk ptapiflqgl sdlkvmdgsq vtmtvqvsgn pppeviwlhn gneigesedf
     hfeqrgtqhs lciqevfped tgtytceawn sagevrtqav ltvqephdgt qpwfiskprs
     vtaslgqsvl iscaiagdpf ptvhwlrdgk alckdtghfe vlqnedvftl vlkkvqpwha
     gqyeillknr vgecscqvsl mlqnssaral prgrepasce dlcgggvgad gggsdrygsl
    rpgwpargqg wleeedgedv rgvlkrrvet rqhteeairq qeveqldfrd llgkkvstkt
20
    lseddlkeip aeqmdfranl qrqvkpktvs eeerkvhspq qvdfrsvlak kgtsktpvpe
    kvpppkpatp dfrsvlggkk klpaengsss aetlnakave sskplsnagp sgplkpvgna
    kpaetlkpmg nakpaetlkp mgnakpdenl ksaskeelkk dvkndvnckr ghagttdnek
    rsesqgtapa fkqklqdvhv aegkklllqc qvssdppati iwtlngktlk ttkfiilsqe
    gslcsvsiek alpedrglyk cvakndagqa ecscqvtvdd apasentkap emksrrpkss
    lppvlgtesd atvkkkpapk tppkaamppq iiqfpedqkv ragesvelfg kvtgtqpitc
    twmkfrkqiq esehmkvens engskltila arqehcgcyt llvenklgsr qaqvnltvvd
    kpdppagtpc asdirssslt lswygssydg gsavqsysie iwdsanktwk elatcrstsf
    nvqdllpdhe ykfrvrainv ygtsepsqes elttvgekpe epkdevevsd ddekepevdy
30
    rtvtintegk vsdfydieer lgsgkfgqvf rlvekktrkv wagkffkays akekenirge
    isimnclhhp klvqcvdafe ekanivmvle ivsggelfer iidedfelte recikymrqi
    segveyihkq givhldlkpe nimcvnktgt riklidfgla rrlenagslk vlfgtpefva
    pevinyepig yatdmwsigv icyilvsgls pfmgdndnet lanvtsatwd fddeafdeis
    ddakdfisnl lkkdmknrld ctqclqhpwl mkdtknmeak klskdrmkky marrkwqktg
35
    navraigrls smamisglsg rksstgspts plnaeklese edvsqaflea vaeekphvkp
    yfsktirdle vvegsaarfd ckiegypdpe vvwfkddqsi resrhfqidy dedgncslii
    sdvcgdddak ytckavnslg eatctaeliv etmeegegeg eeeee
```

### 40 SEQ ID NO. 46

AF069601

Homo sapiens myosin light chain kinase isoform 2 (MLCK) mRNA, complete cds

ccggctgcct ctgctgcagt tcagagcaac ttcaggagct tcccagccga gagcttcagg acgctttcc tgtccactg gcccagttgc cacaacaaac aacagagaag acggtgacca tgggggatgt gaagctggtt gcctcgtcac acatttccaa aacctccctc agtgtggatc cctcaagagt tgactccatg cccctgacag aggcccctgc tttcattttg cccctcgga acctctgcat caaagaagga gccaccgcca agttcgaagg gcgggtccgg ggttacccag agccccaggt gacatggcac agaaacgggc aacccatcac cagcgggggc cgcttcctgc tggattgcgg catccggggg actttcagcc ttgtgattca tgctgtcat gaggaggaca ggggaaagta tacctgtgaa gccaccaatg gcagtggtgc tcgccaggtg acagtggagt tgacagtaga aggaagtttt gcgaagcagc ttggtcagc tgttgtttcc aaaaccttag gggatagatt ttcagcttca gcagtggaga cccgtcctag catctgggg gagtgcccac

|    | caaagtttgc  | taccaagctg | ggccgagttg | tggtcaaaga | aggacagatg | ggacgattct |
|----|-------------|------------|------------|------------|------------|------------|
|    |             |            |            | aggtcacctg |            |            |
|    | tgcagccgag  | tgcccgtgtg | tctgtgtctg | agaagaacgg | catgcaggtt | ctggaaatcc |
| _  | atggagtcaa  | ccaagatgac | gtgggagtgt | acacgtgcct | ggtggtgaac | gggtcgggga |
| 5  | aggcctcgat  | gtcagctgaa | ctttccatcc | aaggtttgga | cagtgccaat | aggtcatttg |
|    | tgagagaaac  | aaaagccacc | aattcagatg | tcaggaaaga | ggtgaccaat | gtaatctcaa |
|    | aggagtcgaa  | gctggacagt | ctggaggctg | cagccaaaag | caagaactgc | tccagccccc |
|    | agagaggtgg  | ctccccaccc | tgggctgcaa | acagecagee | tcagccccca | agggagtcca |
|    | agctggagtc  | atgcaaggac | tegeccagaa | cggccccgca | gaccccggtc | cttcagaaga |
| 10 |             |            |            | gagttcagcc |            |            |
|    | tgggggtcct  | atcaccttct | ggagaagaga | ggaagaggcc | agctcctccc | cgtccagcca |
|    | ccttccccac  | caggcagcct | ggcctgggga | gccaagatgt | tgtgagcaag | gctgctaaca |
|    | ggagaatccc  | catggagggc | cagagggatt | cagcattccc | caaatttgag | agcaagcccc |
|    | aaagccagga  | ggtcaaggaa | aatcaaactg | tcaagttcag | atgtgaaggg | cttgccgtga |
| 15 |             |            |            | tgaaggactg |            |            |
|    | attttgtgct  | gcagtgctcc | gtacggggga | ccccagtgcc | ccggatcact | tggctgctga |
|    |             |            |            | cctgcgaggc |            |            |
|    |             |            |            | cctacacctg |            |            |
|    |             |            |            | tccatgaaaa |            |            |
| 20 |             |            |            | ccactgcacc |            |            |
|    | ctgatctcaa. | agtcatggat | ggaagccagg | tcactatgac | tgtccaagtg | tcagggaatc |
|    | caccccctga  | agtcatctgg | ctgcacaatg | ggaatgagat | ccaagagtca | gaggacttcc |
|    | actttgaaca  | gagaggaact | cagcacagcc | tttggatcca | ggaagtgttc | ccggaggaca |
|    | cgggcacgta  | cacctgcgag | gcctggaaca | gcgctggaga | ggtccgcacc | caggccgtgc |
| 25 | tcacggtaca  | agagcctcac | gatggcaccc | agccctggtt | catcagtaag | cctcgctcag |
|    | tgacagcctc  | cctgggccag | agtgtcctca | tctcctgcgc | catagctggt | gacccctttc |
|    | ctaccgtgca  | ctggctcaga | gatggcaaag | ccctctgcaa | agacactggc | cacttcgagg |
|    |             |            |            | ttctaaagaa |            |            |
|    | gccagtatga  | gatectgete | aagaaccggg | ttggcgaatg | cagttgccag | gtgtcactga |
| 30 | tgctacagaa  | cagctctgcc | agagcccttc | cacgggggag | ggagcctgcc | agctgcgagg |
|    | acctctgtgg  | tggaggagtt | ggtgctgatg | gtggtggtag | tgaccgctat | gggtccctga |
|    | ggcctggctg  | gccagcaaga | gggcagggtt | ggctagagga | ggaagacggc | gaggacgtgc |
|    | gaggggtgct  | gaagaggcgc | gtggagacga | ggcagcacac | tgaggaggcg | atccgccagc |
|    | aggaggtgga  | gcagctggac | ttccgagacc | tcctggggaa | gaaggtgagt | acaaagaccc |
| 35 | tatcggaaga  | cgacctgaag | gagatcccgg | ccgagcagat | ggatttccgt | gccaacctgc |
|    | agcggcaagt  | gaagccaaag | actgtgtctg | aggaagagag | gaaggtgcac | agcccccagc |
|    | aggtcgattt  | tegetetgte | ctggccaaga | aggggacttc | caagaccccc | gtgcctgaga |
|    | aggtgccacc  | gccaaaacct | gccaccccgg | attttcgctc | agtgctgggt | ggcaagaaga |
|    |             |            |            | ccgagaccct |            |            |
| 40 |             |            |            | cagggccctt |            |            |
|    | agcctgctga  | gaccctgaag | ccaatgggca | acgccaagcc | tgccgagacc | ctgaagccca |
|    | tgggcaatgc  | caagcctgat | gagaacctga | aatccgctag | caaagaagaa | ctcaagaaag |
|    | acgttaagaa  | tgatgtgaac | tgcaagagag | gccatgcagg | gaccacagat | aatgaaaaga |
|    | gatcagagag  | ccaggggaċa | gccccagcct | tcaagcagaa | gctgcaagat | gttcatgtgg |
| 45 | cagagggcaa  | gaagctgctg | ctccagtgcc | aggtgtcttc | tgacccccca | gccaccatca |
|    | tctggacgct  | gaatggaaag | accctcaaga | ccaccaagtt | catcatcctc | tcccaggaag |
|    | gctcactctg  | ctccgtctcc | atcgagaagg | cactgcctga | ggacagaggc | ttatacaagt |
|    | gtgtagccaa  | gaatgacgct | ggccaggcgg | agtgctcctg | ccaagtcacc | gtggatgatg |
|    | ctccagccag  | tgagaacacc | aaggccccag | agatgaaatc | ccggaggccc | aagagctctc |
| 50 |             |            |            | cgactgtgaa |            |            |
|    |             |            |            | tcatccagtt |            |            |
|    |             |            |            | aagtgacagg |            |            |
|    | cctggatgaa  | gttccgaaag | cagatccagg | aaagcgagca | catgaaggtg | gagaacagcg |
|    | agaatggcag  | caagctcacc | atcctggccg | cgcgccagga | gcactgcggc | tgctacacac |
| 55 | tgctggtgga  | gaacaagetg | ggcagcaggc | aggcccaggt | caacctcact | gtcgtggata |

agccagacce eccagetgge acacettgtg ectetgacat teggagetee teactgacee tgtcctggta tggctcctca tatgatgggg gcagtgctgt acagtcctac agcatcgaga totgggaete agecaacaag acgtggaagg aactagecae atgeegeage acctetttea acgtecagga cetgetgeet gaccaegaat ataagtteeg tgtaegtgea atcaaegtgt atggaaccag tgagccaagc caggagtctg aactcacaac ggtaggagag aaacctgaag agccgaagga tgaagtggag gtgtcagatg atgatgagaa ggagcccgag gttgattacc ggacagtgac aatcaatact gaacaaaaag tatctgactt ctacgacatt gaggagagat taggatetgg gaaatttgga eaggtettte gaettgtaga aaagaaaact egaaaagtet gggcagggaa gttcttcaag gcatattcag caaaagagaa agagaatatc cggcaggaga ttagcatcat gaactgcctc caccacccta agctggtcca gtgtgtggat gcctttgaag 10 aaaaggccaa catcgtcatg gtcctggaga tcgtgtcagg aggggagctg tttgagcgca tcattgacga ggactttgag ctgacggagc gtgagtgcat caagtacatg cggcagatct cggagggagt ggagtacatc cacaagcagg gcatcgtgca cctggacctc aagccggaga acatcatgtg tgtcaacaag acgggcacca ggatcaagct catcgacttt ggtctggcca .15 ggaggetgga gaatgegggg tetetgaagg teetetttgg caceecagaa tttgtggete ctgaagtgat caactatgag cccatcggct acgccacaga catgtggagc atcggggtca tetgetacat cetagteagt ggcettteec cetteatggg agacaacgat aacgaaacet tggccaacgt tacctcagcc acctgggact tcgacgacga ggcattcgat gagatctccg acgatgccaa ggatttcatc agcaatctgc tgaagaaaga tatgaaaaac cgcctggact gcacgcagtg ccttcagcat ccatggctaa tgaaagatac caagaacatg gaggccaaga 20 aactctccaa ggaccggatg aagaagtaca tggcaagaag gaaatggcag aaaacgggca atgctgtgag agccattgga agactgtcct ctatggcaat gatctcaggg ctcagtggca ggaaatcctc aacagggtca ccaaccagcc cgctcaatgc agaaaaacta gaatctgaag aagatgtgtc ccaagctttc cttgaggctg ttgctgagga aaagcctcat gtaaaaccct 25 atttctctaa gaccattcgc gatttagaag ttgtggaggg aagtgctgct agatttgact gcaagattga aggataccca gaccccgagg ttgtctggtt caaagatgac cagtcaatca gggagtcccg ccacttccag atagactacg atgaggacgg gaactgctct ttaattatta gtgatgtttg cggggatgac gatgccaagt acacctgcaa ggctgtcaac agtcttggag aagccacctg cacagcagag ctcattgtgg aaacgatgga ggaaggtgaa ggggaagggg aagaggaaga agagtgaaac aaagccagag aaaagcagtt tctaagtcat attaaaagga ctatttctct caaaatcca

## SEQ ID NO. 47

35 AAH07433 and P09493 tropomyosin 1 alpha chain.

1 mdaikkmqm lkldkenald raeqaeadkk aaedrskqle delvslqkkl kgtedeldky
61 sealkdaqek lelaekkatd aeadvaslnr riqlveeeld raqerlatal qkleeaekaa
40 121 desergmkvi esraqkdeek meiqeiqlke akhiaedadr kyeevarklv iiesdlerae
181 eraelsegqv rqleeqlrim dqtlkalmaa edkysqkedr yeeeikvlsd klkeaetrae
241 faersvtkle ksiddledel yaqklkykai seeldhalnd mtsm

## 45 SEQ ID NO. 48

 ${\rm NM\_000366}$  and  ${\rm BC007433}$  Homo sapiens tropomyosin 1 (alpha), mRNA (cDNA clone), complete cds

```
1 gaggaatgeg gtegeecet tgggaaagta catatetggg agaagcagge ggeteegege
61 tegeaetee geteeteege eegaeegege getegeeceg eegeteetge tgeageecea
121 gggeeeteg eegeegea catggaege ateaagaaga agatgeagat getgaagete
181 gacaaggaga aegeettgga tegagetgag eaggeggagg eegaeaagaa ggeggeggaa
241 gacaggagea ageagetgga agatgagetg gtgteaetge aaaagaaaet eaagggeaee
55 301 gaagatgaae tggacaaata ttetgagget etcaaagatg eecaggagaa getggagetg
```

```
361 gcagagaaaa aggccaccga tgctgaagcc gacgtagctt ctctgaacag acgcatccag
     421 ctggttgagg aagagttgga tcgtgcccag gagcgtctgg caacagcttt gcagaagctg
     481 gaggaagctg agaaggcagc agatgagagt gagagaggca tgaaagtcat tgagagtcga
     541 gcccaaaaag atgaagaaaa aatggaaatt caggagatcc aactgaaaga ggcaaagcac
5
     601 attgctgaag atgccgaccg caaatatgaa gaggtggccc gtaagctggt catcattgag
     661 agcgacctgg aacgtgcaga ggagcgggct gagctctcag aaggccaagt ccgacagctg
     721 gaagaacaat taagaataat ggatcagacc ttgaaagcat taatggctgc agaggataag
     781 tactcgcaga aggaagacag atatgaggaa gagatcaagg tcctttccga caagctgaag
     841 gaggetgaga etegggetga gtttgeggag aggteagtaa etaaattgga gaaaagcatt
10
     901 gatgacttag aagacgagct gtacgctcag aaactgaagt acaaagccat cagcgaggag
     961 ctggaccacg ctctcaacga tatgacttcc atgtaaacgt tcatccactc tgcctgctta
    1021 caccetgccc tcatgctaat ataagtttct ttgcttcact tctcccaaga ctccctcgtc
    1081 gagetggatg teccacetet etgagetetg catttgteta ttetecaget gaceetggtt
    1141 ctctctctta gcatcctgcc ttagagccag gcacacactg tgctttctat tgtacagaag
    1201 ctcttcgttt cagtgtcaaa taaacactgt gtaagctaaa aaaaaaaaa aaaaaa
```

20 EITALAPSTMK

SEQ ID NO. 50

25 MLTELEK

SEQ ID NO. 51

30 ALNSIIDVYHK

SEQ ID NO. 52

35 GADVWFK